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# Conscientious Workmen or Booksellers' Hacks?

## The Professional Identities of Science Writers in the Mid-Nineteenth Century

*By Aileen Fyfe\**

### ABSTRACT

Existing scholarship on the debates over expertise in mid-nineteenth-century Britain has demonstrated the importance of popular writings on the sciences to definitions of scientific authority. Yet while men of science might position themselves in opposition to the stereotype of the merely popular writer, the self-identity of the popular writer remained ambiguous. This essay examines the careers of William Charles Linnaeus Martin (1798–1864) and Thomas Milner (1808–ca. 1883) and places them in the context of others who made their living by writing works on the sciences for the general reader. Martin wrote on zoology and Milner moved between astronomy, geology, and geography. The essay unravels the close but ambivalent relationship between the professions of authorship and of science and highlights writing as another aspect of scientific practice. Both writers were moderately financially successful, but Martin's sense of failure and Milner's satisfaction reflect their contrasting images of their professional identity.

**D**AVID BREWSTER STRESSED THE DIFFICULTY of surviving as a scientific writer when he assured the young James David Forbes, in 1830, that “making up your income by your pen” was “the worst of all professions.” Brewster himself relied on writing for his income, so this advice came from hard experience.<sup>1</sup> To Forbes, a Scottish baronet's

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<sup>1</sup> David Brewster to James David Forbes, 11 Feb. 1830, quoted in John Campbell Shairp, Peter Guthrie Tait, and A. Adams-Reilly, *Life and Letters of James David Forbes, FRS* (London: Macmillan, 1873), p. 59. See also William H. Brock, “Brewster as Scientific Journalist,” in *“Martyr of Science”: Sir David Brewster, 1781–1863: Proceedings of a Bicentennial Symposium*, ed. Alison Morison-Low and John R. R. Christie (Edinburgh: Royal Scottish Museum, 1984), pp. 37–44.

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youngest son who needed to find a role in life, writing seemed to offer a way to make a name for himself as a man of science while also generating an income. But Brewster's greater experience in the subtleties of the book trade led him to advise Forbes that the introductory treatise on meteorology he had in mind was not the sort of publication that would make his reputation.

Two decades later, the young Thomas Henry Huxley did indeed make his name, and eventually his career, through his writing about science. But by the 1850s an increasingly clear division had developed between writings that contributed to a scientific reputation (and usually paid little) and those that paid the bills (but did nothing for one's reputation). It was Huxley's research papers, presented at the learned societies and published in scientific journals, that made his name, while his book reviews, general periodical articles, and translations of foreign works supplemented his naval half-pay and enabled him to pay his rent.<sup>2</sup> In the 1850s an introductory treatise of the sort Forbes wanted to write would not have made his name, but in the 1830s scientific reputation was not yet so tightly tied to the publication of original research. It was quite possible for men (and sometimes women) who had published little or nothing to be highly regarded for their knowledge and expertise, demonstrated through their personal collections of natural objects or their learned conversation.<sup>3</sup> Those who did not have direct access to the circles of polite society, because of geography or social class, might gain attention and approbation through careful publication. The appropriate publication would not be a closely argued technical research paper but a work promising rational amusement and information to a general readership. This was how people who had already secured scientific reputations presented their work—consider Charles Lyell's *Principles of Geology* (1830–1833) or William Buckland's 1836 Bridgewater Treatise on geology and mineralogy—and, in principle, writers who could match them for style and content might be favorably received in the same circles.

The career of John Gould clearly demonstrates that appropriate publications could indeed bring scientific reputations to those outside polite London society. Gould was a gardener's son who started publishing in the mid 1830s and ended up as a respected ornithologist and vice president of the Zoological Society. Similarly, Philip Henry Gosse, an artist's son, won himself a reputation for observational accuracy and election to the Royal Society with his publications from the late 1840s.<sup>4</sup> For both these men of lowly social background, generalist scientific writing had the virtue of drawing the attention of the learned while also bringing in money. It is not difficult to see why it also appealed to Forbes in distant Edinburgh.

Men of Forbes's social class, with university educations, had few opportunities to earn a living from the sciences in the 1830s. They could try for one of the few university

<sup>2</sup> On Huxley's writing at this time see Adrian Desmond, *Huxley: The Devil's Disciple* (London: Joseph, 1994), Chs. 9–10. On writing as a way of communicating research to other specialists see Alan G. Gross, Joseph E. Harmon, and Michael S. Reidy, *Communicating Science: The Scientific Article from the Seventeenth Century to the Present* (New York: Oxford Univ. Press, 2002); Greg Myers, *Writing Biology: Texts in the Social Construction of Scientific Knowledge* (Madison: Univ. Wisconsin Press, 1990); Jan Golinski, *Making Natural Knowledge: Constructivism and the History of Science* (Cambridge: Cambridge Univ. Press, 1998), Ch. 4; and Charles Bazerman, *Shaping Written Knowledge: The Genre and Activity of the Experimental Article in Science* (Madison: Univ. Wisconsin Press, 1988).

<sup>3</sup> I thank Jim Secord for sharing his thoughts on science, conversation, and polite society.

<sup>4</sup> Gould's rise is described in Isabella Tree, *The Ruling Passion of John Gould: A Biography of the Bird Man* (London: Barrie & Jenkins, 1991). See also Gordon C. Sauer, *John Gould, the Bird Man: A Chronology and Bibliography* (London: Sothoran, 1982). Gosse's reputation later suffered from his publication of *Omphalos* (1857). On his life and work see Ann Thwaite, *Glimpses of the Wonderful: The Life of Philip Henry Gosse, 1810–1888* (London: Faber, 2002) (hereafter cited as **Thwaite, *Glimpses of the Wonderful***).

professorships or, a few years later, seek a post in the Geological Survey. Most likely, however, they would enter one of the learned professions. Thus, although Forbes dreamed of a science professorship, he also took the exams that would enable him to become an advocate while simultaneously consulting Brewster about writing as an alternative to the law. Scientific writing was the rare example of a genteel money-earning scientific occupation. There was arguably more money-making potential in the sciences for men of a lower social class, since gentlemen and institutions frequently employed people to look after their specimens or instruments or to collect new specimens. Gould, for example, stuffed birds for the Zoological Society, and Gosse traveled to Jamaica to collect insects and birds.<sup>5</sup> Writing appealed not simply as an alternative way of earning (or supplementing) such a living but because it offered practitioners the opportunity to transcend their subservient intellectual positions by developing their own thoughts and ideas and to improve their social standing by bringing them into the ranks of the genteel.

Writing on the sciences therefore seemed to offer literate men of all classes a way to pursue their interests, earn money, build a reputation, and cross geographical and class divides. Of course, only a lucky few gained all of these rewards. The problem with Forbes's plan was that the introductory treatise he had in mind was the wrong sort of generalist book for his purposes. As Brewster was aware, a wide variety of books for nonspecialist readers existed, but not all were equally likely to gain the attention of polite society. Those most likely to do so, such as learned and lengthy books that presented the results of research in an attractive narrative, were, like the most authoritative textbooks and the essays in encyclopedias from the *Britannica* downward, the fruits of years of scholarship, not the works of novice writers.

More within the reach of writers like Forbes were translations, commentaries, introductions, lower-level textbooks, children's books, short introductory treatises, and articles in magazines. All of these would bring in money, and few of them would harm the reputation of someone who was already well known; but whether they could create a reputation for an unknown was ambiguous. Mary Somerville's translation of Laplace, for instance, made her quite renowned, while many other translators remained anonymous.<sup>6</sup> In general, while it was possible to make a living and a literary career from publications of this kind, it would be very difficult to build a scientific reputation on them alone. If, indeed, one became known primarily as a writer of these sorts of works, one might be seen as so closely linked to the commercial book trade that any claims to independent scientific expertise were prejudiced.

William Buckland clearly thought in this way when, in 1842, he urged the prime minister, Robert Peel, to grant a civil list pension to the comparative anatomist Richard Owen. Without this support, Buckland claimed, Owen would be "obliged to descend to the condition of a Bookseller's Hack," which would be incompatible with a continuation of his scientific career and would be both "an irreparable loss to the world of science" and a matter for "national reproach." Buckland was surely overstating his case for maximum

<sup>5</sup> The frustrations of trying to make a living from science in the 1840s and 1850s are apparent in the case of the Geological Survey men discussed in James A. Secord, *Victorian Sensation: The Extraordinary Publication, Reception, and Secret Authorship of Vestiges of the Natural History of Creation* (Chicago: Univ. Chicago Press, 2000), Ch. 14. Forbes's choice of a profession is discussed in Shairp *et al.*, *Life and Letters of Forbes* (cit. n. 1), Ch. 4. Gosse was self-employed during his trip to Jamaica, but he had an arrangement with a London dealer for the purchase of his specimens; see Thwaite, *Glimpses of the Wonderful*, pp. 121–143.

<sup>6</sup> On Somerville see James A. Secord, ed., *The Collected Works of Mary Somerville*, 9 vols. (Bristol: Thoemmes, 2004), introductions to Vols. 1–3.

effect, but his dismissiveness toward any writing other than the recording of research is indicative of the changing attitudes to scientific writing around midcentury. As is clear from the reactions to *Vestiges of the Natural History of Creation* (1844), those who argued in favor of expertise in the sciences often gave the impression that there could be no middle ground between scientific authority and hackwork. *Vestiges*, of course, neatly demonstrates the problems with such polar oppositions, as contemporaries struggled to decide whether it could be dismissed as “popular” or should be engaged with as a piece of serious scholarship.<sup>7</sup>

Science writers, however, did not belong only to the scientific world, and in the contemporary literary world there was a well-recognized intermediate category of publication. As the *British Quarterly Review* explained in 1855, in addition to the original and creative works of “true, or high literature” and the “trash” that was produced by unprincipled copying, compilation, and dilution, it was important to recognize the existence of “wholesome popular literature.” Those who produced such works were clear, precise, and accurate; they performed a “useful and honorable” role in formal and informal education. According to the *Review*, “such authorship, in fact, is a species of industry greatly in request, and with which an intelligent and conscientious workman may respectably and honourably earn a livelihood.”<sup>8</sup>

The fact that literary men acknowledged the existence of a wide range of writers is an indication that the debates about professionalization proceeded along different lines in literature and the sciences.<sup>9</sup> The key question for commentators discussing whether authorship had become a profession was money, rather than demonstrable expertise. There was a *de facto* acknowledgment that, if writers were able to make up most or all of their income by being paid for the publication of their works, then they were professionals, regardless of the quality of their prose, the possible immorality of their subject matter, or the low social class of their audience. These writers could be distinguished from the “physicians with few patients, clergymen on small livings, idle women, [and] rich men” who also wrote for publication but were not reliant on it.<sup>10</sup>

<sup>7</sup> William Buckland to Robert Peel, 12 Jan. 1842, quoted in Nicolaas Rupke, *Richard Owen: Victorian Naturalist* (New Haven, Conn.: Yale Univ. Press, 1994), p. 52; the role of patronage in Owen’s social rise is charted in Chs. 1–2. On the debate over the status of *Vestiges* see, e.g., Richard Yeo, “Science and Intellectual Authority in Mid-Nineteenth-Century Britain: Robert Chambers and *Vestiges of the Natural History of Creation*,” *Victorian Studies*, 1984, 28:5–31; and Secord, *Victorian Sensation* (cit. n. 5), esp. Chs. 7, 12. I am here using “popular” to refer to a genre of scientific publications and not, for instance, to science as practiced by members of the working classes. On the various meanings of “popular science” see Roger Cooter and Stephen Pumfrey, “Separate Spheres and Public Places: Reflections on the History of Science Popularization and Science in Popular Culture,” *History of Science*, 1994, 32:237–267.

<sup>8</sup> [David Masson], “Present Aspects and Tendencies of Literature,” *British Quarterly Review*, 1855, 21:157–181, on p. 167.

<sup>9</sup> On professionalization see Harold Perkin, *The Origins of Modern English Society, 1780–1880* (London: Routledge, 1969); and T. W. Heyck, *The Transformation of Intellectual Life in Victorian England* (London: Croom Helm, 1982). On professionalization in science see Roy Porter, “Gentlemen and Geology: The Emergence of a Scientific Career, 1860–1920,” *Historical Journal*, 1978, 21:809–836; and Joseph Ben-David, *The Scientist’s Role in Society: A Comparative Study*, rpt. ed. (London: Univ. Chicago Press, 1984). On professionalization in authorship see John Sutherland, *Victorian Novelists and Publishers* (London: Athlone, 1976); Victor Bonham-Carter, *Authors by Profession* (London: Society of Authors, 1978); and Nigel Cross, *The Common Writer: Life in Nineteenth-Century Grub Street* (Cambridge: Cambridge Univ. Press, 1985).

<sup>10</sup> [George Henry Lewes], “The Condition of Authors in England, Germany, and France,” *Fraser’s Magazine*, 1847, 35:285–295, on p. 285. See also [J. W. Kaye], “Pendennis: The Literary Profession,” *North British Review*, 1850, 13:335–372; and “Authors and Publishers [1],” *New Quarterly Review*, 1854, 3:9–17. Once a literary professional was defined as one who lived by his writing, the next issue was whether authorship was a profession like other professions, given that it lacked entry qualifications and its practitioners had no shared group identity.

By the 1830s, and certainly by the 1840s, there was already a group of scientific writers who were successful professionals in the literary sense even as they remained on the fringes of the scientific world. The scientific writers who are most familiar to historians are those who later succeeded in building scientific reputations, but the existence of many others is clear from the growing number of articles and books on the sciences that were being published in these decades. All these works must have had authors—yet the common practice of anonymity for certain forms of publication means that their identities are often unknown. And even when their names are known, it is often the case that little other biographical information survives. These writers can be studied through their printed works, but deducing anything about personal motivations from such texts is difficult. Two such writers were William Charles Linnaeus Martin (1798–1864) and Thomas Milner (1808–ca. 1883); they are unusual in that their life stories can be recreated from their surviving letters and their publishers' archives. Their experiences clearly demonstrate that science writing was a viable (if still difficult) career option by midcentury. Martin made his living from 1839 onward by writing on zoology, producing at least twenty-five popular books and over six hundred periodical articles. Milner supported his family by writing on geology, geography, astronomy, and history from 1847 until his death. At least thirteen of his books were on the sciences, and many of his national histories included material on natural history.<sup>11</sup> Although both were moderately financially successful, Martin's sense of failure and Milner's satisfaction reflect their contrasting conceptions of their professional identity.

In contrast to the stories told in the "lives and letters" of eminent Victorian gentlemen of science, Martin's and Milner's letters reveal a great deal about their personal circumstances. The letters were written to the Royal Literary Fund, an institution founded in 1790 to provide relief to distressed writers. Its committee (which at various times included Roderick Murchison and Richard Owen) made grants of around £20–£50 to those with an established record of publication. The fund's secretary was also frequently consulted for advice on the granting of civil list pensions to deserving authors. Given the nature of the fund, the archival correspondence reveals more about the problems of writing than its pleasures. Most letters cite illness, deaths in the family, or bankruptcies in the book trade in justification of their grant applications. Despite this, it would be misleading to cast applicants to the Literary Fund as the failures of the mid-nineteenth-century literary world, for many respected figures sought its assistance at some stage of their careers.<sup>12</sup> Thomas Milner applied successfully to the fund on four occasions: twice in the 1850s, after publishers' bankruptcies; once on his wife's death in 1868; and once after the stroke that eventually ended his life. These four applications at times of evident crisis cannot undermine the fact that Milner was a successful professional writer for almost thirty-five years.

Amongst the tales of woe, the Literary Fund letters offer evidence about the everyday routine of the writer. Authorship, like science, is frequently imagined as an intellectual

<sup>11</sup> A list of the surviving British publishers' archives can be found in Alexis Weedon and Michael Bott, *British Book Trade Archives, 1830–1939* (History of the Book—On Demand Series) (Bristol: Simon Eliot and Michael Turner, 1996). Full bibliographies for both Martin and Milner can be found in Aileen Fyfe, *Science and Salvation: Evangelicals and Popular Science Publishing in Victorian Britain* (Chicago: Univ. Chicago Press, 2004) (hereafter cited as **Fyfe, *Science and Salvation***), Ch. 6, which discusses their religious motivations in detail.

<sup>12</sup> On the Royal Literary Fund see Cross, *Common Writer* (cit. n. 9), Ch. 1; on scientific involvement in the fund, particularly before the founding of the Science Relief Fund in 1859, see *ibid.*, pp. 55–58; the question of the representativeness of the applicants is discussed *ibid.*, pp. 3–4. The archive has been published by World Microfilms; see Nigel Cross, *The Royal Literary Fund, 1790–1918: An Introduction to the Fund's History and Archives, with an Index of Applicants* (London: World Microfilms, 1984).

pursuit, yet the daily business of writing (and researching and correcting) books and magazine articles involved physical activity. Historians have become increasingly aware that the sciences rely on particular practices, for instance, of observation and experimentation. Writing, too, was a practical activity that took place in particular locations, at particular times, and with particular rituals.<sup>13</sup> As professional writers, Martin and Milner would certainly have perfected the practices of researching, note taking, writing (or dictating), correcting, and re-drafting. Their example should remind us to consider writing as another of the practices in which virtually all men of science participated.

This essay will draw on Martin's and Milner's lives, along with those of Gosse, Gould, and some of their contemporaries, to discuss why science writing was an attractive career option, what was involved in earning an adequate income, and whether it was a fulfilling vocation. It thus unravels some of the issues relating to the status and role of science writers at midcentury and explores their connections to both the literary and the scientific communities. The move toward professionalization in the sciences provides part of the context, but there were equally important changes within the British book trade that affected all writers, including those who specialized in the sciences. The first section, therefore, outlines the key changes in the book trade over the late eighteenth and nineteenth centuries and their impact on science writers.

#### SCIENTIFIC AUTHORSHIP AND THE BOOK TRADE

In eighteenth-century Britain the audience for printed works on all subjects had been limited by low literacy rates and the high prices of books. By the middle of the nineteenth century those limitations were fading away, and print was becoming the first of the mass media.<sup>14</sup> As publishers began to target wider audiences, so the opportunities for writers increased. Whereas popular literature had previously comprised little more than chapbooks, ballads, and tracts, by midcentury publishers were producing a wide range of magazines and books aimed at the lower-middle classes and even some of the working classes. Rather than being read by a few hundred people, some books were now reaching tens of thousands, and some magazines had hundreds of thousands of readers.<sup>15</sup> Thus it was possible for the

<sup>13</sup> On the practice of science see, e.g., Andrew Pickering, ed., *Science as Practice and Culture* (Chicago: Univ. Chicago Press, 1992). The argument regarding writing as a practical activity has been made more extensively in Fyfe, *Science and Salvation*, Ch. 5.

<sup>14</sup> On the transformation of the book trade see John Feather, *A History of British Publishing* (London: Routledge, 1988), Ch. 11; Simon Eliot, *Some Patterns and Trends in British Publishing, 1800–1919* (London: Bibliographic Society, 1994); Aled Jones, ed., *Powers of the Press: Newspapers, Power, and the Public in Nineteenth-Century England* (Aldershot: Scolar, 1996); and Alexis Weedon, *Victorian Publishing: The Economics of Book Production for a Mass Market, 1836–1916* (Aldershot: Ashgate, 2003). On the mass media see James Curran and Jean Seaton, *Power without Responsibility: The Press and Broadcasting in Britain*, 4th ed. (London: Routledge, 1991). American literacy followed different patterns than British literacy, but the American book trade benefited from the same changes in printing technologies in the first half of the nineteenth century. Higher literacy rates meant that the impact of these new technologies was more immediate than in Britain. See Richard D. Brown, *Knowledge Is Power: The Diffusion of Information in Early America, 1700–1865* (New York: Oxford Univ. Press, 1990); and Ronald J. Zboray, *A Fictive People: Antebellum Economic Development and the American Reading Public* (New York: Oxford Univ. Press, 1993).

<sup>15</sup> Victor E. Neuburg, *Popular Literature: A History and a Guide* (Harmondsworth: Penguin, 1977), Chs. 3, 4. Contemporaries were slow to realize that the lower-middle classes (rather than the working classes) were the key beneficiaries of cheaper print. Although the working classes began to form part of the reading audience from midcentury, print cannot be considered to have been universally available until the very late nineteenth century. On working-class reading audiences see R. K. Webb, *The British Working Class Reader, 1790–1848: Literacy and Social Tension* (London: Allen & Unwin, 1955); Richard D. Altick, *The English Common Reader: A Social History of the Mass Reading Public, 1800–1900* (Chicago/London: Univ. Chicago Press, 1957); Jon P. Klancher,

sciences to become “popular,” not in the modern sense that opposes “popular” to “expert,” but in the older sense that indicates publications that, because of their lower prices or simpler language (or both), reached beyond traditional book-buying audiences into what was perceived as “the people.”<sup>16</sup>

In the late eighteenth century it had been primarily the high price of print that restricted its circulation to the well-to-do ranks of society—the aristocracy, the gentry, and learned professionals. Literacy did extend further into the middling ranks, but few could afford prices of ten shillings or more per volume. Meanwhile, the workers had neither money nor literacy. Things first began to change at the very end of the eighteenth century and into the first decades of the nineteenth, when a greater range of books became available at a more moderate price of five or six shillings. These were reprints of older works that, thanks to changes in the copyright law in 1774, were now freely available for reissue by enterprising publishers. By the 1820s these lower prices had enabled more of the middle classes to become book buyers, though they did little to help the working classes. This first phase of the expansion of reading audiences, however, created relatively few new opportunities for writers. The books that were becoming more widely available were reprints, and their production involved little or no new literary work. Equally, many of the cheap magazines of the day relied heavily on reprinting extracts from other magazines.<sup>17</sup>

The sciences occupied only a small corner of the literary marketplace (less than 4 percent at the start of the nineteenth century), but they were nevertheless a distinct and recognizable sector.<sup>18</sup> From the mid-eighteenth century onward, in addition to learned works on the sciences, there had been a regular output of less technical works, often addressed to women and children.<sup>19</sup> The market for such works demonstrates a continuing interest in the sci-

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*The Making of English Reading Audiences, 1790–1832* (Madison: Univ. Wisconsin Press, 1987), Ch. 3; and Patrick Joyce, *Visions of the People: Industrial England and the Question of Class, 1848–1918* (Cambridge: Cambridge Univ. Press, 1991), Chs. 10–11.

<sup>16</sup> I would hardly deny that nontechnical expository works on the sciences existed before the mid-nineteenth century; but I would argue that these works were not “popular” in the full sense of the word (and could not be until the eighteenth-century public sphere was transformed into the nineteenth-century mass audience). On the etymology of “popular” and “popular science” see the *Oxford English Dictionary*, s.v. “popular,” meaning 4a. The OED’s first recorded usage of “popular science” is from 1841. On changing meanings of “popular” and “the people” see Morag Shiach, *Discourse on Popular Culture: Class, Gender, and History in Cultural Analysis, 1730 to the Present* (Cambridge: Polity, 1989), pp. 1–34.

<sup>17</sup> On reading in the eighteenth and early nineteenth centuries see John Brewer, *The Pleasures of the Imagination: English Culture in the Eighteenth Century* (London: Harper Collins, 1997), Chs. 3–4; and William St. Clair, *The Reading Nation in the Romantic Period* (Cambridge: Cambridge Univ. Press, 2004). Before 1774, books in England remained perpetually in copyright, despite a 1710 act to the contrary. See John Feather, “The Publishers and the Pirates: British Copyright-Law in Theory and Practice, 1710–1775,” *Publishing History*, 1987, 22:5–32; Feather, *Publishing, Piracy, and Politics* (London: Mansell, 1995), Ch. 3; and Richard D. Altick, “From Aldine to Everyman: Cheap Reprint Series of the English Classics, 1830–1906,” *Studies in Bibliography*, 1958, 11:3–25. Once the copyright law changed publishers did sometimes employ an editor to abridge or update a work, though they relied chiefly on reprints. On the extracting practices of magazines see Jonathan R. Topham, “John Limbird, Thomas Byerley, and the Production of Cheap Periodicals in Regency Britain,” *Book History*, 2005, 8 (forthcoming).

<sup>18</sup> Figures for 1801–1810 suggest that the sciences comprised 3.47 percent of all titles published by the British book trade, rising to 4.36 percent by the 1840s; see Simon Eliot, “Patterns and Trends and the NSTC: Some Initial Observations: Part II,” *Publishing Hist.*, 1998, 43:71–112, Table E. Weedon, *Victorian Publishing* (cit. n. 14), pp. 90–93, discusses the change in market share of science and other subjects and compares the typical print runs in the various categories. A very rough subject analysis for the eighteenth century may be found in John Feather, “British Publishing in the Eighteenth Century: A Preliminary Subject Analysis,” *Library*, 1986, 6th Ser., 8:32–46. For the early nineteenth-century scientific book trade see Jonathan R. Topham, “Scientific Publishing and the Reading of Science in Early Nineteenth-Century Britain: An Historiographical Survey and Guide to Sources,” *Studies in History and Philosophy of Science*, 2000, 31A:559–612.

<sup>19</sup> On science for women see Marina Benjamin, “Elbow Room: Women Writers on Science, 1790–1840,” in

ences within the middle classes, which went far beyond the commercial men who attended coffeehouse lectures to learn about mechanics or navigation. Many of these eighteenth- and early nineteenth-century science books were written by women, for whom writing was one of the few acceptable means of participating in the sciences. We now know a great deal about such writers as Priscilla Wakefield, Jane Marcet, Charlotte Smith, and Sarah Fitton.<sup>20</sup> Of the male science writers who were active between the 1790s and 1830s, many (including Jeremiah Joyce, Olinthus Gregory, and Thomas Dick) appear to have combined writing with their roles as professional educators, such as tutoring and schoolteaching.<sup>21</sup>

Few of these figures made writing their sole occupation; rather, such work almost always provided a supplement to their personal or family incomes. It would have been difficult to find enough literary work to live on. It has been estimated that barely 175 science books of any sort (including research monographs, astronomical tables, and school primers) were being published each year at the start of the nineteenth century, and only those that were first editions of original works had provided paid work for a writer.<sup>22</sup> Brewster was one of the few who did live entirely from his writings in the 1810s and 1820s, and he was referred to by an Edinburgh publisher as “Dr B., who is very clever, but who after all is starving.”<sup>23</sup>

By 1871, census figures would reveal almost two and a half thousand people claiming to be writers, a fivefold increase from the start of the century that suggests a significant

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*Science and Sensibility: Gender and Scientific Enquiry, 1780–1945*, ed. Benjamin (Oxford: Blackwell, 1991), pp. 27–69; Ann B. Shteir, *Cultivating Women, Cultivating Science: Flora’s Daughters and Botany in England, 1760–1860* (London: Johns Hopkins Univ. Press, 1996), Chs. 1–3; and Bernard Lightman, ed., *Science Writing by Women* (Bristol: Thoemmes, 2004), introduction. On science for children see James A. Secord, “Newton in the Nursery: Tom Telescope and the Philosophy of Tops and Balls, 1761–1838,” *Hist. Sci.*, 1985, 23:127–151; Aileen Fyfe, “Reading Children’s Books in Eighteenth-Century Dissenting Families,” *Hist. J.*, 2000, 43:453–474; Fyfe, “Young Readers and the Sciences,” in *Books and the Sciences in History*, ed. Marina Frasca-Spada and Nicholas Jardine (Cambridge: Cambridge Univ. Press, 2000), pp. 276–290; and Fyfe, *Science for Children* (Bristol: Thoemmes, 2003), introduction. On the growth of the scientific book trade see A. J. Meadows, ed., *The Development of Science Publishing in Europe* (Amsterdam: Elsevier, 1980); and Andrew Hunter, ed., *Thornton and Tully’s Scientific Books, Libraries, and Collectors: A Study of Bibliography and the Book Trade in Relation to the History of Science*, 4th ed. (Aldershot: Ashgate, 2000).

<sup>20</sup> On audiences for science in the early to mid-eighteenth century see Simon Schaffer, “Natural Philosophy and Public Spectacle in the Eighteenth Century,” *Hist. Sci.*, 1983, 21:1–43; and Larry Stewart, “Public Lectures and Private Patronage in Newtonian England,” *Isis*, 1986, 77:47–58. On Wakefield see Ann B. Shteir, introduction to Priscilla Wakefield, *Mental Improvement; or, The Beauties and Wonders of Nature and Art* (1794–1797; East Lansing, Mich.: Colleagues, 1995); and Shteir, *Cultivating Women, Cultivating Science*, Ch. 4. On Marcet see David Knight, “Accomplishment or Dogma: Chemistry in the Introductory Works of Jane Marcet and Samuel Parkes,” *Ambix*, 1986, 33:94–98; M. Susan Lindee, “The American Career of Jane Marcet’s *Conversations on Chemistry*, 1806–1853,” *Isis*, 1991, 82:8–23; Shteir, *Cultivating Women, Cultivating Science*, Ch. 4; Greg Myers, “Fictionality, Demonstration, and a Forum for Popular Science: Jane Marcet’s *Conversations on Chemistry*,” in *Natural Eloquence: Women Reinscribe Science*, ed. Barbara T. Gates and Shteir (Madison: Univ. Wisconsin Press, 1997), pp. 43–60; Saba Bahar, “Jane Marcet and the Limits to Public Science,” *British Journal for the History of Science*, 2001, 34:29–49; and Aileen Fyfe, introduction to Jane Marcet, *Conversations on Chemistry* (1806; Bristol: Thoemmes, 2004). On Smith and Fitton see Shteir, *Cultivating Women, Cultivating Science*, Chs. 3–4.

<sup>21</sup> Joyce was unusual, at this time, in that he earned his living solely from writing (but not just on the sciences) for the final fifteen years of his life; see John R. Issitt, “The Life and Work of Jeremiah Joyce” (Ph.D. diss., Open Univ., 2000). On Dick see William J. Astore, *Observing God: Thomas Dick, Evangelicalism, and Popular Science in Victorian Britain and America* (Aldershot: Ashgate, 2001). On Gregory see the entry in Bernard Lightman, ed., *Dictionary of Nineteenth-Century British Scientists*, 4 vols. (Bristol: Thoemmes, 2004).

<sup>22</sup> According to Simon Eliot, 1,750 science books were published in the decade 1801–1810; see Eliot, “*Patterns and Trends and the NSTC*, Pt. II” (cit. n. 18), Table E. This estimate is based on Dewey decimal classifications and must be considered very approximate.

<sup>23</sup> The identification of “Dr B.” as Brewster is a guess, but it seems probable. For the description see Adam Black to W. L. Alexander, ca. 1831, quoted in James Ross, *W. Lindsay Alexander, DD, LL.D.: His Life and Work, with Illustrations of His Teaching* (London: Nisbet, 1887), p. 43. On Brewster see Brock, “Brewster as Scientific Journalist” (cit. n. 1); and Mrs. Gordon, *The Home Life of Sir David Brewster* (Edinburgh, 1869).

change in the attractiveness and viability of writing as a career. Adult literacy had climbed to around 60 percent by midcentury, thanks to the increased efforts to educate the children of the poor. Meanwhile, technical innovations in the book trade (particularly steam printing and stereotyping) reduced the cost of print.<sup>24</sup>

Publishers began to use these technologies to take print to the newly literate reading audiences, experimenting with penny periodicals in the 1820s and 1830s and with shilling books in the 1840s and 1850s. This led to an enormous expansion of the reading audience that could not be satisfied entirely by reprints.

By midcentury, publishers were becoming increasingly aware of the different educational backgrounds of their various readers and realized that those with little more than basic literacy might find it difficult to follow the complex language of reprinted excerpts or books originally intended for better-educated readers. Commissioning new works, at a more appropriate level, was one solution. Moreover, even better-educated readers might appreciate newly written works, since recent extensions to copyright law meant that the books now available for reprint were at least forty years old and thus increasingly likely to contain archaic language and out-of-date facts.<sup>25</sup> This was a particular issue in subject areas with many new discoveries and changing terminology, including the sciences. For both books and magazines, therefore, publishers increasingly needed the active services of living writers.

Many of the earliest publishers to become aware of the possibilities and needs of the new reading audiences were philanthropically motivated societies and firms that wished to encourage working-class self-improvement. Such publishers as the Society for the Diffusion of Useful Knowledge (SDUK), W. & R. Chambers, the Religious Tract Society (RTS), and the Society for Promoting Christian Knowledge (SPCK) regarded the sciences as a key part of their program of education.<sup>26</sup> Their most successful early attempts were

<sup>24</sup> For the 1871 census figures see Cross, *Common Writer* (cit. n. 9), p. 3. On literacy statistics see R. S. Schofield, "Dimensions of Illiteracy in England, 1750–1850," in *Literacy and Social Development in the West: A Reader*, ed. Harvey J. Graff (Cambridge: Cambridge Univ. Press, 1981), pp. 201–213; see also Weedon, *Victorian Publishing* (cit. n. 14), pp. 50–51. On literacy more generally see David Vincent, *Literacy and Popular Culture: England, 1750–1914* (Cambridge: Cambridge Univ. Press, 1989); David F. Mitch, *The Rise of Popular Literacy in Victorian England: The Influence of Private Choice and Public Policy* (Philadelphia: Univ. Pennsylvania Press, 1992); and Vincent, *The Rise of Mass Literacy: Reading and Writing in Modern Europe* (Oxford: Polity, 2000). On school education see W. A. C. Stewart and W. P. McCann, *The Educational Innovators, 1750–1880* (London: Macmillan, 1967); and T. W. Laqueur, *Religion and Respectability: Sunday Schools and Working-Class Culture, 1780–1850* (New Haven, Conn.: Yale Univ. Press, 1976). For a general overview of technical innovations in the book trade see Feather, *History of British Publishing* (cit. n. 14), pp. 129–179. On the specific cost implications of these changes see Weedon, *Victorian Publishing*, Ch. 3. On the technologies themselves see Philip Gaskell, *A New Introduction to Bibliography* (Oxford: Clarendon, 1972); and Michael Twyman, *Printing, 1770–1970: An Illustrated History of Its Development and Uses in England* (London: British Library, 1999).

<sup>25</sup> Copyright protection had become forty-two years, or the life of the author, in 1842. See Mark Rose, *Authors and Owners: The Invention of Copyright* (Cambridge, Mass./London: Harvard Univ. Press, 1993); and Feather, *Publishing, Piracy, and Politics* (cit. n. 17), Chs. 5–6.

<sup>26</sup> On the Society for the Diffusion of Useful Knowledge see J. N. Hays, "Science and Brougham's Society," *Annals of Science*, 1964, 20:227–241; Harold Smith, *The Society for the Diffusion of Useful Knowledge, 1826–46* (Halifax, N.S.: Dalhousie Univ. Press, 1974); Scott Bennett, "Revolutions in Thought: Serial Publication and the Mass Market for Reading," in *The Victorian Periodical Press*, ed. Joanne Shattock and Michael Wolff (Leicester: Univ. Leicester Press, 1982); David Vincent, *Bread, Knowledge, and Freedom: A Study of Nineteenth-Century Working-Class Autobiography* (London: Methuen, 1982), Ch. 7; Patricia Anderson, *The Printed Image and the Transformation of Popular Culture, 1790–1860* (Oxford: Clarendon, 1991), Ch. 2; and Jonathan R. Topham, "Science and Popular Education in the 1830s: The Role of the *Bridgewater Treatises*," *Brit. J. Hist. Sci.*, 1992, 25:397–430. On Chambers see Sondra Miley Cooney, "Publishers for the People: W. & R. Chambers—The Early Years, 1832–50" (Ph.D. diss., Ohio State Univ., 1970); and Robert Scholnick, "'The Fiery Cross of Knowledge': Chambers's *Edinburgh Journal*, 1832–43," *Victorian Periodicals Review*, 1999, 32:324–

low-priced periodicals. The major monthly religious magazines typically cost several pence and sold twenty to thirty thousand copies, but the weekly penny magazines of these philanthropic publishers could sell up to a hundred thousand copies.<sup>27</sup> The presumed non-political nature of the sciences made them appropriate content for these magazines, with the presentation varying from secular to Christian. These new magazines, with their high periodicity (compared to the older quarterlies) and emphasis on newly written material, created significant opportunities for writers. Those who could write in an appropriate style and meet tight deadlines time after time found themselves in demand to keep the magazines stocked with articles. This was how William Martin began his writing career in the early 1830s (see Figure 1). There was sufficient demand for him to write and sell at least one article a week on natural history.

By the 1840s, entrepreneurial book publishers were starting to adopt the new methods and technologies of the periodical publishers. The output of the British book trade experienced its greatest rate of growth for the whole century in the 1840s and 1850s, and the opportunities for writers increased still further.<sup>28</sup> Four times as many titles on the sciences were being published annually as at the start of the century; and since steam printing involved larger print runs, the actual number of copies of books available to readers increased perhaps eightfold.<sup>29</sup> By 1850 there were plenty of books available at 2s.6d., and a good number that cost just a shilling, indicating that many of these books were intended for the new audiences. These developments meant that there was more literary work available, that writers commanded more respect from publishers, and that they might hope for better pay.

For science writers, despite their subject matter, publishers were the ultimate arbiters of authority who decided which writers would get the opportunity to convey their thoughts to the world. Those publishers who owned scientific journals or regularly issued research monographs (as John Murray did for Lyell and Darwin, among others) had extensive

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358. On the Religious Tract Society see Aileen Fyfe, "Commerce and Philanthropy: The Religious Tract Society and the Business of Publishing," *Journal of Victorian Culture*, 2004, 9:164–188. Little has yet been written on the science works of the Society for Promoting Christian Knowledge, but see Topham, "Science and Popular Education in the 1830s"; and William K. L. Clarke, *A History of the SPCK* (London: SPCK, 1959).

<sup>27</sup> On the low-priced periodicals of the educational publishers see Geoffrey Cantor, Gowan Dawson, Graeme Gooday, Richard Noakes, Sally Shuttleworth, and Jonathan R. Topham, *Science in the Nineteenth-Century Periodical* (Cambridge Univ. Press, 2004), introduction. On religious magazines and their science content see Topham, "Science, Natural Theology, and the Practice of Christian Piety in Early Nineteenth-Century Religious Magazines," in *Science Serialized: Representations of the Sciences in Nineteenth-Century Periodicals*, ed. Cantor and Shuttleworth (Cambridge, Mass.: MIT Press, 2004), pp. 37–66; and Topham, "The Wesleyan-Methodist Magazine and Religious Monthlies in Early Nineteenth-Century Britain," in Cantor *et al.*, *Science in the Nineteenth-Century Periodical*, pp. 67–90. On the penny magazines see Anderson, *Printed Image and the Transformation of Popular Culture*, Chs. 2, 3, 5. By midcentury, some penny magazines reached circulations of half a million a week.

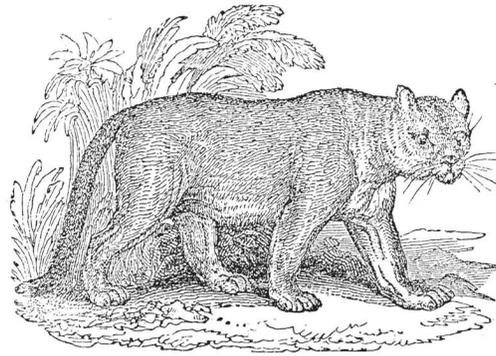
<sup>28</sup> The changes in the methods and technologies of the entrepreneurial book publishers are discussed in Secord, *Victorian Sensation* (cit. n. 5), Ch. 2; and Fyfe, *Science and Salvation*, Ch. 1. For statistical analysis of the British book trade see the work of Simon Eliot: Eliot, *Some Patterns and Trends in British Publishing* (cit. n. 14); Eliot, "Some Trends in British Book Production, 1800–1919," in *Literature in the Market Place: Nineteenth-Century British Publishing and Reading Practices*, ed. John O. Jordan and Robert L. Patten (Cambridge: Cambridge Univ. Press, 1995), pp. 19–43; Eliot, "Patterns and Trends and the NSTC: Some Initial Observations, Part I," *Publishing Hist.*, 1997, 42:79–104; and Eliot, "Patterns and Trends and the NSTC, Pt. II" (cit. n. 18). See also Weedon, *Victorian Publishing* (cit. n. 14). For a comparison between periodical and book output see Cantor *et al.*, *Science in the Nineteenth-Century Periodical*, p. 10, Fig. 1.2.

<sup>29</sup> For the increase in numbers of titles see the works by Eliot cited in note 28, above. Weedon provides print-run data, but her first figures are only from 1836. Average print runs at midcentury were over two and a half thousand, compared with the runs of a thousand usually assumed to be typical prior to the introduction of steam printing. See Weedon, *Victorian Publishing*, p. 49.

THE  
WEEKLY VISITOR.

NUMBER XXXIII.]

TUESDAY, JULY 16, 1833.

PRICE  
ONE HALFPENNY.

## THE PUMA.

[*Felis concolor*. L.]

THE characteristic features of the feline race are treachery and ferocity; and it is well for the interests of mankind, that the larger species are but thinly scattered over the surface of the globe. In ancient days, before civilization had spread so generally over regions once thinly peopled by a race of unarmed savages, they appear to have been much more numerous, gradually declining with the increase of population, and the advance of arts and commerce. The lion is now unknown in countries where, upon the authority of ancient testimonies, it once abounded; and the tiger within the memory of man, nay, even the present generation, has disappeared from districts of which it was formerly the scourge. Such is the case in every quarter, not only of the old world, but equally so of the continent of America, where the lion and tiger are represented, though many grades below, by the puma, and the jaguar; animals which, though far less formidable than those celebrated tyrants of the desert and jungle, are still sufficiently dangerous to be regarded as the enemies of man.

The puma (*felis concolor*) has indeed been called the American lion, but certainly without its offering any pretensions to that lofty title, except in as far

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as they may be borne out by uniformity of colour. In size, strength, and courage, it is far inferior; it is even distinguished by an almost opposite contour; the head is small, and the body long and slender. The limbs, it is true, are extremely muscular, but more cat-like in their symmetry; and every action, though free and graceful, is deficient in that haughty, stern, decided bearing, which renders the lion so truly majestic. The puma inhabits the southern and middle regions of America, concealing itself in the thickest woods, and retiring from the precincts of human habitations. Its food consists of quadrupeds and monkeys, which it not only seizes by stratagem, but follows up the trees with great agility. It seldom ventures to attack man, unless compelled in self-defence, or driven hard by hunger; but when enraged, is, from its great agility and vigour, a most formidable opponent.

Lieut. Maw, in an interesting "Journal of a Passage from the Pacific to the Atlantic," following the course of the river Amazon, gives a singular account of the combat of an athletic Peruvian, with an animal most probably of this description, the word tiger being indiscriminately applied to any of the larger species of the genus.

"Our acquaintance," says that writer,

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**Figure 1.** This illustrated article on the puma was one of many written by William Martin for the Religious Tract Society's half-penny Weekly Visitor in his early years as a writer (16 July 1833, p. 257). It was signed "M." In the text he notes that the Zoological Society—his employer—possessed a breeding pair of pumas that could be viewed at their menageries (p. 258).

contacts within the scientific world to help them make decisions based on both scientific and literary merit. And when these publishers issued more general works, they made use of their contacts to acquire the services of recognized men of science. Thus, Murray's "Family Library" and the "Cabinet Cyclopaedia" published by Longman, both in the 1830s, contained volumes by such familiar names as John Herschel and David Brewster; later in the century, the "International Scientific Series" featured T. H. Huxley and John Tyndall.<sup>30</sup>

The problem for publishers, though, was that men with reputations expected higher fees, and learned men of science were not always adept at writing in a style appropriate for a general audience. In 1845 the *Westminster Review* accused men of science of failing to write works that offered a "broad and beaten track on which the multitude can travel onward." For publishers such as Murray, whose "general" publications were nevertheless intended for educated readers, such criticism was irrelevant. But for publishers such as W. & R. Chambers, Charles Knight, or even George Routledge, who genuinely wanted to reach the masses and who knew that cheapness and nontechnical language were essential, eminent men of science were rarely the most appropriate writers. While members of the learned societies might debate who ought to be admitted to the Royal Society and on what grounds, large sections of the general population were learning about the sciences from writers who had little or no hope of meeting those criteria for authority.<sup>31</sup>

Among those science writers active at midcentury, we might note that the Reverend Charles A. Johns and the Reverend Ebenezer C. Brewer both combined writing with schoolteaching, while Charles Tomlinson and Thomas R. Jones taught at King's College London and Richard Potter taught at University College. None of these men had a national scientific reputation, but all were competent writers of popular works and were thus in demand by publishers. Their professional interests in education may have helped direct their writing into an appropriate style. The female midcentury writers came from a variety of professional and commercial families. Margaret Gatty and Mary Ward were the daughters of clergymen, while Mary and Elizabeth Kirby and Rosina Zornlin were the daughters of businessmen or merchants. Gatty and Elizabeth Payne (the wife of an industrial chemist) combined their writing with bringing up a family, which may be why they both specialized in children's books, although Zornlin, Ward, and the Kirby sisters all began their writing careers while single. Since most women lacked advanced educations, they were unlikely to become overly technical, and, like the ministers and teachers, they were relatively cheap. Unlike famous novelists or eminent scholars, these writers had no "name" that added value to their work (and sometimes they literally had no name, as their writings were published anonymously).<sup>32</sup>

<sup>30</sup> On the "Family Library" see Scott Bennett, "John Murray's Family Library and the Cheapening of Books in Early Nineteenth-Century Britain," *Stud. Bibliog.*, 1976, 29:139–166. On the "International Scientific Series" see Roy M. MacLeod, "Evolutionism, Internationalism, and Commercial Enterprise in Victorian Britain: The International Scientific Series, 1871–1910," in *Development of Science Publishing in Europe*, ed. Meadows (cit. n. 19), pp. 63–93; and Leslie Howsam, "An Experiment with Science for the Nineteenth-Century Book Trade: The International Scientific Series," *Brit. J. Hist. Sci.*, 2000, 33:187–207.

<sup>31</sup> [John Crosse], "Review of *Kosmos* and *Vestiges*," *Westminster Review*, 1845, 44:152–202, on p. 153 (which targets Mary Somerville as well as John Herschel and William Whewell). Murray's "Family Library" (1830s) and "Home and Colonial Library" (1840s) were both mid-priced series. His "Reading for the Rail" (1851–1853) did offer shilling volumes but was even more short lived than the other series. Regarding the debates within learned societies see Jack Morrell and Arnold Thackray, *Gentlemen of Science: Early Years of the British Association for the Advancement of Science* (Oxford: Oxford Univ. Press, 1981).

<sup>32</sup> More details on all the writers mentioned in this paragraph can be found in their entries in Lightman, ed., *Dictionary of Nineteenth-Century British Scientists* (cit. n. 21). On the prevalence of minister-writers at the

Particularly attractive to publishers was the growing band of full-time writers. These people were often from the same sorts of social groups as the part-time writers just mentioned—indeed, some of them had retired from their first careers, tempted by the prospect of greater success as writers—but they occasionally came from lower down the social scale and hoped for social advancement through their contributions to literature. These full-time writers had proven themselves skilled both at writing for popular audiences and at such mundane things as meeting deadlines, producing exactly the required number of pages of text, and refraining from making extensive corrections in proof.<sup>33</sup> They were in demand for their literary, not scientific, expertise. It is difficult to say how many full-time science writers there were at midcentury, partly because of conventions of anonymity and partly because the sciences were still a very small niche in which to specialize. Thomas Milner, for instance, wrote on geography and history as well as the sciences.

These full-time writers, together with their part-time colleagues (or competitors)—the ministers, teachers, journalists, and doctors and their wives and daughters—produced the science articles in magazines that reached a hundred thousand people each week and the books that sold fifteen or twenty thousand copies. They were far more influential in the popularization of the sciences than such better-known authors as Brewster and Herschel or Huxley and Tyndall. Yet it is difficult to discover much about the lives or aspirations of these writers, particularly those full-time practitioners who did not have another profession in which to forge a reputation. The remaining sections of this essay tell the stories of William Martin's and Thomas Milner's careers as full-time scientific writers and use their lives to provide rare insights into the experiences of professional science writers. Their examples tell us a great deal about the trials, tribulations, and rewards of scientific writing amidst the new literary opportunities and the gathering debates about scientific expertise in the 1840s and 1850s.

#### BECOMING A SCIENCE WRITER

In 1847 George Henry Lewes argued that even writers who were only in the “ordinary current” were able to bring in “incomes *averaging* 300*l.* a-year, some less, of course, some more.” Lewes estimated that, realistically, a writer could look to earn between £200 and £1,000 a year. If he was correct, full-time writing could be expected to yield a respectable middle-class income. Assistant clerks in the civil service earned £300–£500 a year, while a parish offering such an annual income would enable a minister to marry and start a family. In contrast, a young minister in his very first parish, or a small-town schoolteacher, might earn £100 a year, which could be considered respectable only if he were frugal and single. The upper income range of Lewes's estimate was enjoyed mostly by a few suc-

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Religious Tract Society see Fyfe, *Science and Salvation*, Chs. 5–6. On schoolteacher-writers at Chambers see Cooney, “Publishers for the People” (cit. n. 26), pp. 175–181. On anonymous writing see Robert J. Griffin, “Anonymity and Authorship,” *New Literary History*, 1999, 30:877–895; and Griffin, ed., *The Faces of Anonymity: Anonymous and Pseudonymous Publication from the Sixteenth to the Twentieth Century* (London: Palgrave, 2003).

<sup>33</sup> This group of full-time science writers expanded in the later nineteenth century, and their names became better known than those of the midcentury group. See Bernard Lightman, “‘The Voices of Nature’: Popularising Victorian Science,” in *Victorian Science in Context*, ed. Lightman (Chicago: Univ. Chicago Press, 1997), pp. 187–211; Lightman, “The Story of Nature: Victorian Popularizers and Scientific Narrative,” *Victorian Review*, 1999, 25:1–29; and Lightman, “The Visual Theology of Victorian Popularizers of Science: From Reverent Eye to Chemical Retina,” *Isis*, 2000, 91:651–680. On writing as a possible route for social advancement see Cross, *Common Writer* (cit. n. 9), Ch. 4; and Fyfe, *Science and Salvation*, Ch. 5.

cessful novelists. Dickens, Thackeray, and Trollope, for instance, could earn several hundred or even a thousand pounds per novel and were able to become distinctly well-off.<sup>34</sup> They became prominent public figures in the “profession” of authorship, but in terms of earning power they were exceptional.

More typical writers, and particularly those working in nonfiction, could expect to earn a few pounds for an article, some tens of pounds for a short book, and perhaps a hundred pounds for a longer book.<sup>35</sup> Making up £300 a year from these sorts of payments was certainly possible, but it is also clear why, for many of its midcentury practitioners, scientific authorship continued to be a useful supplement to an existing profession. Writing science for a living was not the first-choice career option for either William Martin or Thomas Milner. After all, both had begun their careers in the late 1820s, when the expansion of the literary marketplace was still beginning and authorship would certainly not have seemed a sound long-term prospect. But by the time they changed careers, in the 1840s, authorship was looking increasingly attractive. It still might not have been the ideal long-term choice, but both Martin and Milner found themselves in situations where science writing seemed the best available option.

William Martin’s father had been an actor, geologist, and engraver whose talents won him admission to the Linnean Society. The younger Martin may have trained as an apothecary, and in 1830 he applied successfully for the post of superintendent at the museum of the Zoological Society of London, at a salary of £100.<sup>36</sup> The recently founded society was building up its collections of living and dead animals, and Martin looked after its preserved specimens for the next eight years. He was responsible for preparing and arranging them, and he received occasional assistance from a then-little-known taxidermist named John Gould. Martin was also expected to examine and dissect unusual specimens acquired by the museum, including recently deceased animals from the Zoological Gardens and items donated by such traveling naturalists as Charles Darwin. These dissections were routinely reported in the society’s *Proceedings*, and when Martin identified and named a new genus his research was published in the *Transactions*.<sup>37</sup>

<sup>34</sup> [Lewes], “Condition of Authors” (cit. n. 10), p. 286. For clerical earnings, with comparisons to other professions, see Frances Knight, *The Nineteenth-Century Church and English Society* (Cambridge: Cambridge Univ. Press, 1995), Ch. 4. On Trollope see Victoria Glendinning, *Trollope* (London: Pimlico, 1992); on other authors see Sutherland, *Victorian Novelists and Publishers* (cit. n. 9).

<sup>35</sup> See Fyfe, *Science and Salvation*, pp. 212–213.

<sup>36</sup> On the elder Martin see H. S. Torrens, “Martin, William (1767–1810),” *Oxford Dictionary of National Biography* (Oxford: Oxford Univ. Press, 2004), <http://www.oxforddnb.com/view/article/18216> [accessed 18 Jan. 2005]. Biographical details in the article on the younger Martin in the new *DNB* are very scanty. Instead, see the information he and his wife provided to the Royal Literary Fund, available in their archive (this archive has been published by World Microfilms [1984]; it is hereafter cited as **RLF**). RLF 1315.1: W. Martin’s application form, 9 Apr. 1853; and RFL 1315.53: M. J. Martin’s application form, 1 Mar. 1864. In one of his applications to the Royal Literary Fund Martin claimed to be a licentiate of the “Apothecaries’s Company”; see RLF 1315.46: W. Martin’s application form, 30 Oct. 1863. There is, however, no record of him at Apothecaries Hall; my thanks to Anna Simmons for this information. On his appointment to the Zoological Society see Zoological Society Archive, London (hereafter cited as **ZS**), Minutes of Council, 20 Oct. 1830, p. 44 (see also 20 Apr. 1836, p. 418); and **ZS**, Minutes of the Museum Committee (hereafter cited as **MMC**), 25 Apr. 1836 (where Martin is allowed to continue at £100, despite the official salary for the assistant curator being set at £80).

<sup>37</sup> On the Zoological Society see Henry Scherren, *The Zoological Society of London: A Sketch of Its Foundation and Development* (London: Cassell, 1905); and P. Chalmers Mitchell, *Centenary History of the Zoological Society of London* (London: Zoological Society, 1929). The only surviving volume of the **ZS** Museum Report Book (1833) contains Martin’s daily reports on his and Gould’s activities. Both institutional histories claim that Gould was in charge of the museum before 1836, but they appear to have been blinded by his subsequent rise to fame. See Mitchell, *Centenary History*, p. 98, which is based on Scherren, *Zoological Society*, pp. 33, 53–54. Specimens from the *Beagle* expedition were frequently discussed at the society in January 1837. Martin’s description of a

In early 1836 Martin's natural historical career appeared to be blossoming. The Zoological Society had decided to move its museum to improved premises in Leicester Square, in the center of London, and Martin spent his time worrying about locations, heating, ventilation, and the arrangement of specimens. In keeping with its grander premises, however, the society decided to acquire a grander staff. The existing arrangement of superintendent and preserver was to be replaced with one involving six staff members, including a curator and an assistant curator. The curator was to be "a competent Zoologist in all its branches; of agreeable manners and address." Although John Gould described Martin shortly afterward as "a very intelligent man and a very tolerable naturalist," he was not considered for the curatorship. Although he easily obtained the appointment as assistant curator, his practical experience could not make up for the absence of the educational and social background that the Zoological Society sought in its new curator. The beetle enthusiast George Waterhouse was appointed in April 1836.<sup>38</sup>

Although technically senior to Gould (who was now an employee), Martin found himself effectively demoted to responsibility for the "Fishes, Reptilia, Mollusca and Radiata." And worse was to come. The Zoological Society rapidly realized that its new establishment was too expensive. Even though Gould resigned in January 1838 to collect birds in Australia, cutbacks were needed. After receiving a report on expenditures, the council resolved that "the situations of Assistant Zoological Secretary, and Assistant Curator, be abolished on the 15th of January 1839."<sup>39</sup> Martin would shortly be out of a job.

When Martin considered his prospects, however, he must have felt that he had a good chance of gaining another museum position. During his years at the Zoological Society he had built up expertise in all areas of the animal kingdom. He had published in the society's journals, and well-known naturalists, including George Waterhouse and Richard Owen, were willing to write references for him. Writing must have seemed like the obvious temporary solution until a museum job came along. But although Waterhouse managed to move from the Zoological Society to the British Museum in 1843 (on the strength of references from Owen and Darwin), museum jobs were scarce. Fifteen years after leaving the Zoological Society, Martin was still dreaming of obtaining "some official situation, humble though the salary might be, in which my general acquirements + scientific knowledge would render my services advantageous."<sup>40</sup>

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new *Felis* specimen appeared next to Gould's description of an unusual series of finches from the Galapagos Islands. See *Proceedings of the Zoological Society of London*, 1837, 5:3–4; see also Adrian Desmond and James Moore, *Darwin* (London: Penguin, 1991), pp. 208–211. On the identification of a new genus see W. C. L. Martin, "On a New Genus of Insectivorous Mammalia," *Transactions of the Zoological Society of London*, 1838, 2:249–256.

<sup>38</sup> Martin's work pertaining to the move is described in ZS MMC, 16 Feb. 1836, 4 Apr. 1836. On the new staffing arrangements see ZS MMC, 10 Mar. 1836, 9 Apr. 1836; the qualifications desired in the curator are outlined in ZS MMC, 18 Mar. 1836. For the description of Martin see John Gould to William Jardine, 30 Apr. 1838, quoted in Sauer, *John Gould, the Bird Man* (cit. n. 4), p. 98. On the appointment of Waterhouse see ZS MMC, 25 Apr. 1836; see also Desmond and Moore, *Darwin*, pp. 208–209.

<sup>39</sup> On Martin's new—decreased—responsibilities see ZS MMC, 29 Dec. 1837. Gould had originally been paid per skin stuffed; see ZS MMC, 5 Mar. 1836. He was subsequently paid a salary of £50, with extra for stuffing, and tight restrictions were placed on his use of the society's time and resources; see ZS MMC, 20 Apr. 1836, 28 Apr. 1836. His resignation is noted in ZS MMC, 26 Jan. 1838; the decision to abolish two positions is recorded in ZS, Minutes of Council, 1 Aug. 1838.

<sup>40</sup> RLF 1315.11: W. Martin to RLF, 16 Apr. 1853. On Waterhouse's new post see Desmond and Moore, *Darwin* (cit. n. 37), pp. 309–310. Waterhouse was replaced at the Zoological Society by Louis Fraser, who had previously been appointed clerk to the curator in 1836; see ZS MMC, 16 Apr. 1836. He was probably the other person who lost his position in the 1838/1839 cutbacks. In the interim, he had acted as naturalist on the Niger expedition (1841–1842). This presumably made him more attractive as curator than Martin.

At the time of his dismissal from the Zoological Society, Martin had already been writing for at least five years, particularly for two of the major publishers of cheap instructive literature: the Society for the Diffusion of Useful Knowledge (and its publisher, Charles Knight) and the Religious Tract Society.<sup>41</sup> Both societies contributed to the flood of cheap instructive periodicals in the early 1830s, and Martin contributed regular natural history articles to the *Penny Magazine* (1832–1846) and the half-penny *Weekly Visitor* (1833–1836) from their earliest issues, as well as writing occasional books. The close link between his role at the Zoological Society and his writing career was particularly obvious in his volumes entitled *Menageries*, published by the SDUK in the early 1830s for 4s.6d. These functioned as guides to the Zoological Gardens and were granted permission to be sold on the premises by the “cakewoman at the Elephants’ Stand.”<sup>42</sup>

These experiences would have demonstrated to Martin that writing could bring in money and provided him with connections in the book trade. Indeed, in late 1838 he had little trouble securing a commission (with an annual salary) from the publisher Whitehead to produce “an extensive work upon all the known species of Quadrupeds.”<sup>43</sup> The firm unfortunately became insolvent soon afterward, but Martin nevertheless managed to place enough books with publishers to survive, and writing became his way of life for the foreseeable future.

Thomas Milner took a different path toward scientific authorship. The Derby-born Milner was convinced by the age of sixteen that his vocation was to serve God. After training for the Congregational ministry at Glasgow, he had a charge in Northampton by his late twenties.<sup>44</sup> By his mid thirties, however, Milner began suffering from ill-health, and by the time he was forty he felt unable to perform his duties. In 1847 he decided to resign his charge, move to London, and support his family by writing. As in Martin’s case, this was an informed decision, based on some years of experience as a writer.

Like many young ministers, Milner had published a few works of more worth than likely financial remuneration: a volume on the history of the church, essays and a biography describing model Christian lives, and a collection of sermons. In the early 1840s, however, he began to write on astronomy, and it was this work that brought him to the attention of London publishers and would lead him to produce a publication so successful that science writing seemed to offer a viable future. His first scientific work, *Astronomy and Scripture*

<sup>41</sup> The identification of Martin’s anonymous works for the RTS is straightforward: *Popular Introduction to the Study of Quadrupeds* (1833); and *Introduction to the Study of Birds* (1835). His claim to have written three volumes of the “Library of Entertaining Knowledge” (RLF 1315.8: List of Works 1833–, n.d. [ca. 1853]) for the SDUK is more difficult to verify, since he is not mentioned in the SDUK archives. Given his field of expertise, I believe he wrote three of the four *Menageries* volumes. The archives attribute these to no particular author, and they were supervised by Charles Knight, the editor of the *Penny Magazine*. See Society for the Diffusion of Useful Knowledge Archives, University College, London (hereafter cited as **SDUK**), Entertaining Knowledge Committee Minutes, 1831–33, esp. 6 May 1831; and SDUK, Publications Committee Minutes, 1833–38, esp. 28 Feb. 1833, 4 Mar. 1833, 23 Mar. 1836.

<sup>42</sup> The permission for the sale of the *Menageries* volumes is recorded in ZS, Minutes of Council, 7 Sept. 1831. That this was a rare privilege is indicated in Sofia Åkerberg, “Knowledge and Pleasure at Regent’s Park: The Gardens of the Zoological Society of London during the Nineteenth Century” (Ph.D. diss., Umea Univ., 2001), Ch. 4. The dates of Martin’s three *Menageries* volumes are uncertain because I am not completely sure which of the volumes he wrote. On penny periodicals see Anderson, *Printed Image and the Transformation of Popular Culture* (cit. n. 26), Ch. 2; and Bennett, “Revolutions in Thought” (cit. n. 26). The *Weekly Visitor* later became the *Visitor* (issued monthly for 6d.), and Martin continued to write for it until it closed in 1851; he then wrote for its successor, the *Leisure Hour* (a penny weekly), until his death.

<sup>43</sup> RLF 1315.7: George Waterhouse to RLF, 13 Apr. 1853. Identification of the publisher is based on RLF 1315.3: W. Martin to RLF, 11 Apr. 1853.

<sup>44</sup> For biographical details see *Congregational Year Book* (1859); RLF 1385.1: Milner’s application form, 7 July 1855; and RLF 1385.2: Milner to RLF, 7 July 1855.

(1843), had been published locally and may have been derived from lectures to his congregation or Sunday school. It was written for Christians (particularly those “young persons who revere the word of God”) who were worried by apparent contradictions between the inspired word and what they knew of modern astronomy.<sup>45</sup> Milner was completely confident that there could be no true contradictions, since the heavens were made by the same deity who revealed himself in the Bible, and he justified this position by explaining astronomy and its history.<sup>46</sup>

Shortly after the publication of *Astronomy and Scripture*, Milner was asked by the London publisher William Orr to write a much broader work, covering geology and geography as well as astronomy. It is unclear whether Orr knew that Milner was interested in these additional subjects or whether Milner’s enthusiasm for them resulted from this commission. Originally issued in parts, *The Gallery of Nature: A Pictorial and Descriptive Tour through Creation, Illustrative of the Wonders of Astronomy, Physical Geography, and Geology* (1846) was lavishly illustrated with wood engravings (see Figure 2) and was revised and reprinted several times, demonstrating a longevity far beyond most popular illustrated works of its day. The success of the *Gallery of Nature* may have been the reason that Milner was asked to write a short book for the Religious Tract Society. Milner now had several books to his name, one of which was very successful, and he had connections with two major London publishers. He thus had good reason to suppose that writing would provide a viable alternative career. His life as a writer would be marginally easier than Martin’s, thanks to some property in which his wife had a life interest that provided a small but regular stream of income.<sup>47</sup>

#### MONEY AND THE PROFESSIONAL SCIENCE WRITER

As scientific writers, Martin and Milner used different tactics that reflected their personal areas of expertise and their religious convictions. Their decisions about what to write, in what format, and for which publishers or periodicals had important implications for their earning potential and their literary and scientific reputations. This section concentrates primarily on the financial aspects of their literary careers, while the final section will examine the less tangible rewards of writing. One of the main differences between the two men was that Martin wrote exclusively on zoology (from mammals to radiata), while Milner moved among astronomy, geology, geography, history, and the occasional biography. Milner was college trained and, with access to a decent library, was able to work up his knowledge on a range of different subjects. Martin, however, had learned his zoology

<sup>45</sup> Thomas Milner, *History of the Seven Churches of Asia* (Derby, 1830); Milner, *Life, Times, and Correspondence of Isaac Watts* (London, 1834); Milner, *Sermons on Special Occasions* (Northampton, 1837); Milner, *Sanctuary and Oratory* (London, 1837); and Milner, *Astronomy and Scripture; or, Some Illustrations of That Science, and of the Solar, Lunar, and Terrestrial Phenomena of Holy Writ* (London: John Snow, 1843), p. v. It is unclear how or when Milner became interested in the sciences, but he might have attended the lectures of the natural science professors while studying at Glasgow.

<sup>46</sup> On evangelicals and the sciences see David W. Bebbington, “Science and Evangelical Theology in Britain from Wesley to Orr,” in *Evangelicals and Science in Historical Perspective*, ed. David N. Livingstone, D. G. Hart, and Mark A. Noll (Oxford: Oxford Univ. Press, 1999), pp. 120–141. On science and religion more generally see John Hedley Brooke, *Science and Religion: Some Historical Perspectives* (Cambridge: Cambridge Univ. Press, 1991); and Brooke and Geoffrey Cantor, *Reconstructing Nature: The Engagement of Science and Religion: The Glasgow Gifford Lectures* (Edinburgh: Clark, 1998).

<sup>47</sup> The *Gallery of Nature* was reissued in 1848, 1852, 1855, 1860, and 1880. On Milner’s books and his finances see RLF 1385.1: Milner’s application form, 7 July 1855; compare RLF 1385.16: Milner’s application form, 25 June 1868 (Mrs. Milner died in 1868).

In the grandeur of their cataracts, also, the American rivers far surpass those of other countries, though several falls on the ancient continent have a greater perpendicular height, and are magnificent objects. In Sweden, the Gotha falls about 130 feet at Trolhetta, the



Falls of Trolhetta.

greatest fall in Europe of the same body of water. The river is the only outlet of a lake, a hundred miles in length and fifty in breadth, which receives no fewer than twenty-four rivers; the water glides smoothly on, increasing in rapidity, but quite unruffled, until it reaches the verge of the precipice; it then darts over it in one broad sheet, which is broken by some jutting rocks, after a descent of about forty feet. Here begins a spectacle of great grandeur. The moving mass is tossed from rock to rock, now heaving itself up in yellow

**Figure 2.** *The Trolhetta Falls, Sweden, one of the wood engravings in the chapter on rivers in Thomas Milner's Gallery of Nature (1846), p. 285.*

from practical experience in the museum (and perhaps from his father). He knew the animal world intimately, but he lacked a more general education and the skills—or perhaps the confidence—to venture into new subject areas. Thus, while Milner enterprisingly wrote about Australian geography and natural history shortly after the Victoria gold rush (see Figure 3) and about the histories of Russia and Turkey during the Crimean War, Martin's works remained remarkably similar in content over his entire writing career. Both men were evangelical Protestants (Martin was Anglican, Milner Congregationalist), and both wrote regularly and frequently for the Religious Tract Society, whose rules insisted that

**THE LEISURE HOUR**

A FAMILY JOURNAL OF INSTRUCTION AND RECREATION.

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No. 34. THURSDAY, AUGUST 19, 1852. { PRICE 1d.  
{ STAMPED 2d.

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SKETCHES OF EMIGRANT LIFE:—CLEARING THE GROUND.

AUSTRALIA :

III.—ITS AGRICULTURAL AND PASTORAL LIFE.

From the gold-fields of Australia we proceed to notice its flocks and herds, with their squatters, shepherds, and stockmen, engaged in a depart-

VOL. I.—NO. 34.

ment of industry which, were there not a grain of the precious metal in the soil, powerfully recommends its shores to an emigrating population, by offering immediate employment, good remuneration, and that which is so mournfully wanting at

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**Figure 3.** Milner wrote a series of articles on Australia in autumn 1852 for the Religious Tract Society's *Leisure Hour* (weekly, 1d.). After dealing with the critical issues of the voyage and the gold diggings, he went on in this article to describe the agricultural prospects of the country (19 Aug. 1852, p. 529). Articles in a later series described the flora and fauna.

all topics be treated in a Christian tone.<sup>48</sup> But whereas Milner wrote all his works from a Christian perspective and used the RTS as his major publisher, Martin saw the RTS as one publisher among many and was happy to write in a secular tone for others.

In the 1830s and 1840s, Martin's main publishers were the Religious Tract Society, the Society for the Diffusion of Useful Knowledge, and (after the latter's demise) Charles Knight. Although these publishers disagreed on the role of the spiritual in the materials they published, all were committed to the production of cheap instructive works. Martin's choice of publishers, therefore, meant that the majority of his output was periodical articles and short (hence cheap) introductory books. Milner wrote in these formats as well, but he was a less prolific periodical contributor than Martin, and when he did write articles it was usually for the denominational monthly magazines rather than the cheap instructive magazines. In addition, he had his commissioned works with Orr; and he also became a textbook writer, moving from atlases to writing school history texts for the RTS. By the mid 1850s, his new connection with the eminent house of Longman indicates an ability to write for the mainstream market as well as for the philanthropic publishers. Writing for Longman meant moderately better pay and more respect as a writer, though it also meant a more limited audience. Milner's books with Longman had print runs of just one thousand, whereas his sixpenny RTS books had runs of fifteen thousand copies.<sup>49</sup>

One of the disadvantages of working for the philanthropic publishers was that the rates of pay were not generous—the aim, after all, was to issue the publications as cheaply as possible. The Religious Tract Society and the Society for Promoting Christian Knowledge rarely paid more than £100 or £120 even for their very longest works, and for the short works that they issued in great numbers the payment was much smaller. Martin and Milner received just £30 or £35 for the short volumes they both contributed to the RTS series of “Monthly Volumes” in the late 1840s. Back in the 1830s, the SDUK had paid slightly better for the volumes it published (around £180), but it sought to attract well-known writers and, after all, was not a commercial success. Textbooks were usually worth more than introductory treatises, and Milner received £160 for his RTS *History of Rome*.<sup>50</sup>

These sums were for the purchase of copyright, an arrangement by which the writer received a fee on publication and had no further rights to the work. The publisher was free to produce as many editions, in whatever format, as he wished and to keep all profits. The clear disadvantage of such an arrangement was that, if the work happened to be successful enough to go into more than one edition, the writer benefited only from an enhanced reputation and not from any further income. Thomas Dick, who wrote on astronomy for

<sup>48</sup> The RTS published Milner's *Australia: Its Scenery, Natural History, and Resources* (1853). *The Crimea: Its Ancient and Modern History: The Khans, the Sultans, and the Czars* (1855), *Russia: Its Rise and Progress, Tragedies, and Revolutions* (1856), and *The Ottoman Empire* (1856) were all published by Longman. Other evangelical science writers are mentioned in Secord, *Victorian Sensation* (cit. n. 5), pp. 452–455; and Fyfe, *Science and Salvation*, Ch. 5. On evangelicals and the sciences see Livingstone *et al.*, eds., *Evangelicals and Science in Historical Perspective* (cit. n. 46).

<sup>49</sup> The Longman print runs are listed under the titles in the Miscellaneous Expenses ledger (A3) from 1854–56, Longman Archives, Reading University Library; I thank Michael Bott for this information. The circulation of the RTS “Monthly Volumes,” in which Milner's and Martin's volumes appeared, was initially ten thousand copies—as recorded in RTS Annual Report 1846, p. 102—but production was soon raised to fifteen thousand; see William Jones to Esther Copley, 12 Dec. 1846, RTS Correspondence, RTS Archives, School of Oriental and African Studies, London (hereafter cited as **RTS**).

<sup>50</sup> Regarding payments for the “Monthly Volumes” see, e.g., Religious Tract Society Copyright Committee Minutes (hereafter cited as **RTS CCM**), 9 July 1845, 21 Jan. 1846, 17 Nov. 1847, 20 Feb. 1850. Milner was originally to be paid £120 for the *History of Rome*, but he requested an increase; see RTS CCM, 23 Feb. 1848, 19 Apr. 1848. On the SDUK payments see Bennett, “Revolutions in Thought” (cit. n. 26), pp. 160–161.

the RTS and other publishers, later bemoaned his decision to sell his copyrights, noting that he derived “no pecuniary benefit whatsoever from the sale of my works however extensive it may be.”<sup>51</sup> Yet the advantages of such a deal were equally clear: the writer knew how much he would be paid and did not have to wait for sales to commence to receive his money. Better-known writers, who could exert more bargaining power, often had a shared-profits agreement that gave them a third or even a half share in the eventual profits (or losses) of the publication. Yet even when Martin and Milner became better known, they—like Dick and most other writers of short popular and instructive works—continued to sell their copyrights. They lived so close to the breadline that they needed immediate income and could not afford to wait for the potential profits to be divided.

There was a third possible arrangement between writers and publishers, known as “author’s risk.” Milner may well have encountered it in his younger days as a writer of sermons. In this case, the publisher acted on commission, with the writer paying all bills and taking all profits. It was a highly risky strategy for a writer, especially as publishers were most likely to propose it for works that experience suggested were unlikely to be profitable. On the other hand, it could occasionally pay off.

In the mid 1840s, Philip Henry Gosse was a schoolteacher who wrote for the Society for Promoting Christian Knowledge on history and natural history. He was in a similar position to Milner and was starting to realize that he could give up teaching and earn his living as a writer. Yet the success of his work *The Ocean* (SPCK, 1845) also made him realize that selling copyright was not the best long-term strategy. His first self-published book, about the birds of Jamaica, appeared in 1849, after his return from a collecting trip to Jamaica. Its detailed observations and illustrations drew critical acclaim and may have assisted in his election to the Linnean Society. The book did not bring Gosse a financial profit, but he was sufficiently encouraged to try again. Over the next decade, although he continued to offer books to the SPCK and the publisher Van Voorst, he also issued volumes at his own risk. He was fortunate to start a trend with his books about the seashore and marine biology. *The Aquarium* (1854) alone brought him a most impressive £818, and he made over £2,000 from the five books he published in the mid 1850s.<sup>52</sup> Such a publishing strategy, however, was a huge gamble. It worked for Gosse because he was able to produce books on novel subjects, based on his personal observations in Jamaica and on the Devon coast. Martin’s and Milner’s books, in contrast, were like Gosse’s earlier publications: solid, worthy, but unlikely to make enough of a splash to bring in a huge profit.

Ascertaining exactly how much Martin and Milner published is not a straightforward task, since their periodical articles and some of their short books appeared anonymously. Fortunately, in their applications to the Royal Literary Fund they listed all their major books and most of their short books and gave some indication of their output for the periodicals (see Figure 4). For some of the books, as well, surviving publishers’ archives list the payments, but for others there are no records; and periodicals’ archives frequently

<sup>51</sup> RLF 1241.2: Thomas Dick to RLF, n.d. [1850]. On Dick see Astore, *Observing God* (cit. n. 21). For a contemporary account of the different methods of publishing see “Authors and Publishers [1]” (cit. n. 10); and “Authors and Publishers [2],” *New Quart. Rev.*, 1854, 3:143–150.

<sup>52</sup> Gosse’s literary earnings are given in incredible detail in Richard Broke Freeman and Douglas Wertheimer, eds., *Philip Henry Gosse: A Bibliography* (Folkestone: Dawson, 1980); on the individual books see p. 6. On his realization in the wake of *The Ocean* that selling copyright was not a good strategy see Thwaite, *Glimpses of the Wonderful*, pp. 116–117. For Gosse’s own valuation of his income see *ibid.*, p. 255. On his life, Thwaite’s book corrects the dour impression given by Gosse’s son: Edmund Gosse, *Father and Son: A Study of Two Temperaments* (1907; Keele: Ryburn, 1994).

ROYAL LITERARY FUND.

No. \_\_\_\_\_ Vol. \_\_\_\_\_ Page C. B. \_\_\_\_\_

Read *13 April 1853*  
*£50 granted*  
*J. K. Fisher*  
 Registrar.

**Form of Application.**

Christian name and surname of the Applicant in words at length.	<i>William Charles Leonard Martin</i>			
Widow (or Orphan) of . . . . .	M			
[To be filled up only when the application is made by the Widow or Orphan of an Author.]	who was born on the	at	and died on the	at
Profession, University, or other titles.	<i>Zoologist.</i>			
Age of Applicant; stating when and where born.	Age <i>Fifty five</i> 1798 Born on the <i>27 of January</i> at <i>Burton on Trent.</i>			
Present Residence.	<i>Dacre Park Terrace Lee, Kent.</i>			
Whether single or married; and if married, or having been so, and having a family, the number, respective ages, and circumstances of the children.	<i>Married.</i>			
If relieved before by the Royal Literary Fund; and if so, how often, and to what amount on each occasion.	<i>No.</i>			
Present means and sources of income, whether from Salary, Annuity, Pension, or other kind of provision; and the amount thereof.	<i>No permanent means or sources of income.</i>			
Cause of Distress.	<i>Having no permanent sources of income, but depending upon my pen for support, every fluctuation in the price of paper will affect me, the cause of my distress may be stated. Want of engagements &amp; long &amp; severe illness.</i>			
TITLES OF PUBLISHED WORKS, in full.				
	No. of Vols.	Size.	Place of Publication.	Date of Publication.
<i>History of the Horse. (C. Knight, P.)</i>	<i>one</i>	<i>12<sup>mo</sup></i>	<i>London</i>	
<i>History of the Dog</i>	<i>one</i>	<i>12<sup>mo</sup></i>	<i>London</i>	
<i>The Sheep</i>	<i>Journals Library</i>	<i>4 vol. 8<sup>vo</sup></i>	<i>London</i>	<i>1847-8.</i>
<i>The Dog</i>				
<i>Domestic Poultry</i>				
<i>Pictorial Museum of Animated Nature. by C. Knight</i>	<i>2 vol. 4<sup>to</sup></i>		<i>London</i>	
<i>Natural History of Insects &amp; other Invertebrate animals (by Whitehead &amp; Co.)</i>	<i>in 10<sup>nos</sup></i>	<i>8<sup>vo</sup></i>	<i>London</i>	
<i>General History of Humming Birds by R. Bohn</i>	<i>1 vol.</i>	<i>8<sup>vo</sup></i>	<i>London</i>	<i>1853.</i>

The Works must be submitted to the Examination of the General Committee.

Dated this *ninth* day of *April* — 1853.

(Signature of Applicant.) *W. C. L. Martin*

\*\* This Form of Application must be accompanied by a separate Letter, stating any facts relating to the nature of the Works, or circumstances of the Applicant, which are not comprised in the answers to the above questions.

**Figure 4.** Applicants to the Royal Literary Fund had to fill out a standard form, write a covering letter, and ask referees to send letters directly to the fund's secretary. This form is from the occasion of Martin's first application to the fund, in April 1853. Notice his description of his profession as "zoologist," his admission that the cause of his distress was having "no permanent means or sources of income," and the list of his works. On this application form Martin listed only his books, but on later forms he added periodical articles. (Royal Literary Fund Archives, file 1315, item 1.)

do not record payments for individual articles. Despite these problems, rough estimates of their annual incomes can be made, based on the known rates paid by some publishers and periodicals.<sup>53</sup>

Martin wrote, on average, one periodical article a week over his entire writing career. At a conservative estimate of a pound or two per article, that could bring in £100 a year.<sup>54</sup> In addition, he wrote a variety of short books: for instance, there were two introductory treatises for Charles Knight in 1845, followed by another four in 1849. Those would add around £50 to his income each year. In the late 1840s there was usually also one short RTS volume each year, paying him £35. He may, therefore, have earned around £185 a year. For his part, Milner wrote two of the RTS volumes each year and also produced three textbooks in three years, bringing him a total of around £210 a year in the late 1840s. He would also have written a few periodical articles, and in some years there was also a major work, such as an atlas. Writers' incomes were clearly highly variable from year to year, but we can reasonably assume that Martin and Milner were earning between £150 and £250 a year on average.

These totals are not quite up to the amounts Lewes suggested as realistic potential earnings for a writer, but they were not significantly different from what the men had earned in their former careers. Martin had been able to support himself, his wife, and his aged mother on his £100 museum salary plus whatever he made from writing. Becoming a professional writer may have marginally improved his standard of living. Milner told the Royal Literary Fund that his annual income while a minister had never been over £150.<sup>55</sup> That he had been able to support his wife and three children on this amount was probably possible only because of his wife's income of £100–£120 per year; this supplement continued until his wife's death, by which time the children were self-supporting. Milner's earnings as a writer would seem to have matched, and sometimes improved upon, his income as a minister.

Martin and Milner were, however, earning only enough to subsist; they were never able to accumulate substantial savings. This not only made it impossible for them to retire but could prove awkward in the event of family illness or if the book trade slowed. As Martin wrote in 1853, such times could be difficult indeed: "I could explain to you how, for months + months, I have received no order of any great importance from any publisher—how my days have been spent in restless anxiety, + my nights in mental agony,—until, the body sympathizing with the mind, a terrible malady (spasmodic Asthma) has laid me prostrate." At times of particular crisis, both men sought grants from the Royal Literary Fund, and it is from their letters on these occasions that so much of their lives can be reconstructed. Martin's wife, Mary Jane, particularly appreciated the grants, and her comment about "ready money *in hand* giving great advantage in every kind of purchase" hints at otherwise unpaid bills.<sup>56</sup>

Martin's and Milner's letters to the RLF reveal that the equilibrium of a writer's life was easily disrupted, and they point particularly to publishers' bankruptcies and illness. Bankruptcy was not uncommon in the mid-nineteenth century: Martin suffered from it twice and Milner three times. Writers were usually paid on completion of a manuscript,

<sup>53</sup> For an introduction to using publishers' archives see Weedon, *Victorian Publishing* (cit. n. 14), Ch. 1.

<sup>54</sup> On payments by periodicals in the 1830s see Cooney, "Publishers for the People" (cit. n. 26), pp. 94–95. On RTS rates in the 1840s see RTS CCM, 20 Jan. 1847.

<sup>55</sup> RLF 1315.13: W. Martin's application form, 1 June 1854; and RLF 1385.2: Milner to RLF, 7 July 1855.

<sup>56</sup> RLF 1315.3: W. Martin to RLF, 11 Apr. 1853; and RLF 1315.47: M. J. Martin to RLF, 30 Oct. 1863.

which left them vulnerable in situations where they had devoted much time to the creation of a work for which no payment was forthcoming. As Milner remarked after Orr's bankruptcy in 1854, "I spent eight months upon the work [an introductory volume to "The British Naturalist" series]—never received a sixpence in advance upon it—contracted a heavy debt for books," and then "that house failed, and I was ruinously impoverished."<sup>57</sup> Instead of being paid the impressive £250 he had been promised, Milner received nothing. He had no savings to fall back on, and the only way he could hope to pay his bills and feed his family was by working ever harder.

Fortunately, he had just completed his first book for Longman (on the Baltic) and had the security of two more books commissioned by the firm.<sup>58</sup> He also proposed an ambitious plan to the RTS for four volumes on the natural history and industries of the British Isles, to be followed by four more on the empire. By the middle of the following year, Milner had moved his family to a cheaper house. But by this time the combination of stress and overwork was taking its toll, and his surgeon described him as "suffering from a right hand disabled by incessant activity, and great nervous debility." He continued to write, and in the winter of 1855–1856 he had a breakdown "which incapacitated him for literary work."<sup>59</sup> Fortunately, both of his publishers were willing to grant him small cash advances on his copyright payments, which enabled him to rest his writing hand and regain his health. By mid 1856 his health and finances appear to have been perfectly recovered. It is, however, significant that Milner was already relatively well known in the trade when his breakdown occurred. Publishers did not give advances freely or automatically, and it was crucial that Milner was regarded as reliable and trustworthy.

For a writer with meager savings, illness was a serious matter, as it both prevented him from working and produced medical bills that had to be paid. Milner's amicable relations with his publishers helped him through his brief period of difficulty. Martin, on the other hand, suffered continual health problems from the mid 1850s until his death in 1864, and although he attempted to work from his sickbed (his wife took dictation) he repeatedly applied to the Literary Fund for financial aid. By 1860 his "complicated disorders" included "heart disease" and asthma, as well as a "gouty affection of the *whole system*, the *head* and *stomach* alternately with the limbs." He was often unable to hold a pen, since his hands "discharge[d] portions of chalk attended with ulceration." Despite Mary Jane Martin's "earnest but weak and *most inadequate* struggles," she told the Royal Literary Fund that she feared she and her husband "*must end in utter destitution*." This was not a case where a small advance was needed to tide a struggling writer over until better times came; Martin received regular grants to pay the medical bills for a terminal condition and

<sup>57</sup> RLF 1385.2: Milner to RLF, 7 July 1855. Martin endured the bankruptcies of Baldwin, Cradock & Joy in 1837/1838 and of Whitehead & Company in 1840; Milner was affected by the bankruptcies of W. S. Orr in 1854, William Freeman of Fleet Street in 1857/1858, and W. & R. McPhun of Glasgow in the mid 1870s. Orr's bankruptcy is discussed in William Chambers, *Memoir of Robert Chambers with Autobiographical Reminiscences* (New York: Scribner, Armstrong, 1872), Ch. 13.

<sup>58</sup> No correspondence with Longman survives, but the payments (of £160 in total) are recorded in the Miscellaneous Expenses ledger (A3) from 1854–56, Longman Archives. The final payment for *The Baltic* was on 2 Oct. 1854, just days before Orr's bankruptcy; my thanks to Michael Bott for checking this.

<sup>59</sup> For the proposal for the volumes on the British Isles see RTS CCM, 20 Sept. 1854, 18 Oct. 1854. Only three of the volumes of *Our Home Islands* appeared, in 1857, 1858, and 1860. Milner's family moved from a house that rented for £40 to one that cost only £26; see RLF 1385.2: Milner to RLF, 7 July 1855. The difficulties with his hand are described in RLF 1385.3: Thomas Aspray to RLF, 9 July 1855; see also RLF 1385.2: Milner to RLF, 7 July 1855. The RTS was sufficiently concerned about Milner's breakdown that it sent one of its editors to his Brixton home to inquire after his health; see RTS CCM, 19 Dec. 1855.

a final payment to cover funeral bills and make a small provision for his widow.<sup>60</sup> Again, however, the fact that Martin was able to secure these grants was an indication that he was known and respected in the literary world, thanks to his publications over the previous three decades.

Unexpected crises, such as illness and publishers' bankruptcies, could cause serious problems for writers. Such problems were particularly likely to occur in old age, when it was difficult to maintain the pace of work that had seemed straightforward in more youthful days. Martin and Milner had little hope of being able to retire, and it is not clear whether even Gosse would have been able to do so (his second wife inherited a substantial amount of money in 1864, which distorts the picture).<sup>61</sup> Tempting though it may be to dwell on the problems of Martin and Milner, however, the real lesson to be learned from their careers is that it *was* possible to make a sufficient, though never generous, living by science writing in the mid-nineteenth century.

#### THE FULFILLMENT OF VOCATION

Writing science might produce a respectable income, but whether it was personally fulfilling depended very much on what the individual writer believed his vocation to be. Even after retiring from the ministry, Milner remained committed to serving God. He regarded his new life as an alternative way of fulfilling this vocation. He saw his work in much the same terms as a writer in the nonconformist *North British Review*, who in 1850 emphasized the potential of popular writing not merely for earning money but for helping others. The reviewer reminded his readers that "it is no small thing to influence public opinion—to guide men to light from darkness, to truth from error—to inform the ignorant, to solace the unhappy, to afford high intellectual enjoyment to the few, or healthy recreation to the many." The enlightenment that writers could bring to their readers made authorship a highly responsible undertaking, and "of all professions, worthily pursued, it is the least selfish." Martin also shared this educational vocation at least in part, as we can see from his description of his mission as "to impart some degree of information relative to the laws of organic structure and the thence-deduced rules on which the system of Zoology as a science is founded," while "avoiding the 'clap-trap' style" of monotonous repetition of facts.<sup>62</sup> A writer who had this talent for explaining difficult materials was a valuable asset to the cause of popular education.

Some writers might enlighten their readers only in matters of secular knowledge, but the *North British* reviewer implied that they also had an important opportunity to contribute to readers' spiritual development. Writing could be seen as a "literary labour in the cause of Christian truth" or a "ministry of the press."<sup>63</sup> Ideally, a Christian writer was like a

<sup>60</sup> Martin's afflictions and his wife's struggles and fears about their fate are described in RLF 1315.28: M. J. Martin to RLF, May 1860; and RLF 1315.42: M. J. Martin to RLF, 18 Nov. 1862. Martin received £40 in 1859, then £30 a year for the next four years; his widow received £50 in 1864. See RLF 1315, *passim*. On gout in the early nineteenth century see Roy Porter and G. S. Rousseau, *Gout: The Patrician Malady* (New Haven, Conn.: Yale Univ. Press, 1988), Ch. 8.

<sup>61</sup> Gosse had £14,000 of investments on his death, but it was mostly derived from his second wife's inheritance, according to Thwaite, *Glimpses of the Wonderful*, p. 293. In contrast, successful novelists might be able to save enough to retire. Anthony Trollope did; see Glendinning, *Trollope* (cit. n. 34), esp. pp. 359–361.

<sup>62</sup> [Kaye], "Pendennis: Literary Profession" (cit. n. 10), p. 371; and RLF 1315.11: W. Martin to RLF, 16 Apr. 1853. On vocation see James A. Secord, "The Discovery of a Vocation: Darwin's Early Geology," *Brit. J. Hist. Sci.*, 1991, 24:133–157.

<sup>63</sup> The phrases come from "The Late Mrs. Esther Copley," *Christian Spectator*, 1851, p. 667; and Leonore Davidoff and Catherine Hall, *Family Fortunes: Men and Women of the English Middle Class, 1780–1850* (London: Hutchison, 1987), p. 67 (regarding children's writer Jane Taylor).

minister, sharing the vocation for spreading the gospel but using different media. This combination of factual and spiritual education was what appealed to Milner. As another nonconformist minister, Thomas Pearson, pointed out, the numerous attempts to supply the masses with “acceptable and yet wholesome and elevating reading” by providing “purely religious publications, in the form of tracts or biographies,” had largely failed. Such subject matter was not sufficiently attractive or interesting to appeal to any but committed Christians—and even they might sometimes wish for alternative reading matter. Pearson’s recommendation was that a Christian spirit should be blended into popular works on all subjects. Thus, Christians could read about history and science from the safety of a theological worldview; and the unconverted might be tempted to pick up one of Milner’s book on caves and caverns, or Australian gold fields, without realizing that they would also be exposed to the message of salvation.<sup>64</sup> The expansion of Milner’s subject areas, from his early devotional works to his later geology and geography, was a way of carrying out this design, allowing him to bring the Christian message to a much wider variety of readers. Milner was not alone in wishing to combine informative and educational writing on the sciences with a life dedicated to God: Thomas Dick, John George Wood, and Charles A. Johns had all been ordained, and Philip Henry Gosse was a Brethren pastor.<sup>65</sup>

Even though he wrote on some of the more controversial scientific subjects of his day, Milner was always confident that there were no contradictions between the findings of science and the teachings of religion, although there could certainly be temporary misconceptions. Writing of the nebular hypothesis in 1843, he assured his readers that “there is nothing . . . in the hypothesis, if it were proved to be true, that need disquiet the religious mind.” He maintained that it involved “no new principle under the sun” and that the action of God was as obvious in a gradual developmental scheme of creation as in the older idea of creation in seven days. The same argument appeared in the *Gallery of Nature*, despite the notoriety that the nebular hypothesis had gained in the intervening years through its inclusion in the *Vestiges of the Natural History of Creation* (1844). Similarly, Milner’s geological writings accepted the evidence for the progressive development of the earth and saw no problem in reconciling that with faith.<sup>66</sup> Acceptance of gradual progressive development would not involve a rejection of the God of the Bible, he insisted, but, rather, a reimagining of his creative acts as recorded in Genesis. Some popular works might

<sup>64</sup> Thomas Pearson, *Infidelity: Its Aspects, Causes, and Agencies: Being the Prize Essay of the British Organization of the Evangelical Alliance* (London: Partridge & Oakey, 1853), pp. 509, 505. See also Thomas Arnold on “Christian tone,” quoted in Arthur Penrhyn Stanley, *Life and Correspondence of Thomas Arnold D.D.*, 2 vols. (London: Fellowes, 1844), Vol. 1, p. 252. On the concept of “safe science” see Topham, “Science and Popular Education in the 1830s” (cit. n. 26). For examples of science publishing that were decidedly not “safe” see Adrian Desmond, “Artisan Resistance and Evolution in Britain, 1819–1848,” *Osiris*, 1987, N.S., 3:72–110. For more on the combination of spiritual and secular see Fyfe, *Science and Salvation*, Chs. 2, 3.

<sup>65</sup> Dick was forced to leave the church under rather less salubrious circumstances than Milner’s retirement. See William J. Astore, “Observing God: Thomas Dick (1774–1857), Evangelicalism, and Popular Science in Victorian Britain and Antebellum America” (Ph.D. diss., Univ. Oxford, 1995), Sect. 2.2.

<sup>66</sup> Milner, *Astronomy and Scripture* (cit. n. 45), pp. 371, 370; and Thomas Milner, *The Gallery of Nature: A Pictorial and Descriptive Tour through Creation, Illustrative of the Wonders of Astronomy, Physical Geography, and Geology* (London: Orr, 1846), pp. 188–191 (on the nebular hypothesis), 784–788 (on reconciling evidence from geology with Christian faith). By the 1850s, the nebular hypothesis was mentioned in later editions of the *Gallery* as a theory discredited by the earl of Rosse’s observations; see Milner, *The Gallery of Nature: A Pictorial and Descriptive Tour through Creation, Illustrative of the Wonders of Astronomy, Physical Geography, and Geology*, rev. ed. (London: Orr [?], 1855), pp. 188–189. On Rosse see Simon Schaffer, “The Nebular Hypothesis and the Science of Progress,” in *History, Humanity, and Evolution*, ed. James R. Moore (Cambridge: Cambridge Univ. Press, 1989), pp. 131–164; and Schaffer, “On Astronomical Drawing,” in *Picturing Science, Producing Art*, ed. Caroline A. Jones and Peter Galison (London: Routledge, 1998), pp. 441–474, esp. pp. 456–468. On *Vestiges* and the nebular hypothesis see Secord, *Victorian Sensation* (cit. n. 5), pp. 9–10, 386–387.

present the latest scientific discoveries as evidence of atheism and materialism, but Milner's approach placed the sciences firmly in a Christian framework.<sup>67</sup>

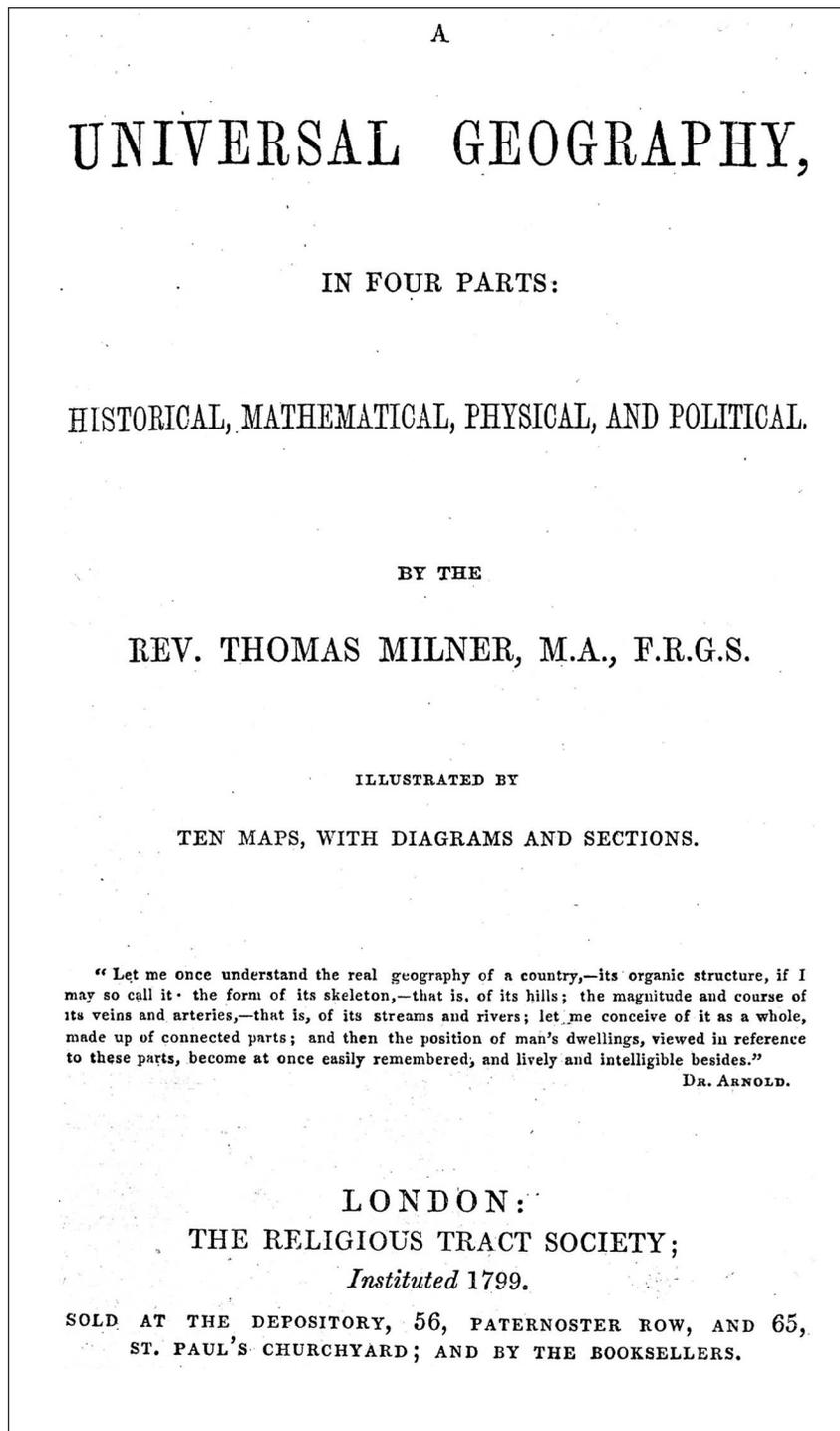
The manner in which Milner constructed that Christian framework depended on the publisher for whom he was working and the intended audience. In his RTS books he stated quite explicitly in both the introduction and the conclusion that the earth was God's creation and should be studied as such. He also carefully inserted a religious moral at the end of each chapter of his RTS work *Caves of the Earth* (1847). In the *Gallery of Nature*, on the other hand, the Christianity was far more muted, limited to occasional passing references to Providence and the creator. True to his vocation, however, the Christian tone was always present. In contrast, although Martin was clearly comfortable writing in a Christian tone (his RTS works often used the Bible as a source of useful information about the early domestication of animals or primitive methods of catching fish), he was also happy to write for Charles Knight, making no mention of religion whatsoever.<sup>68</sup>

Whereas Martin had contacts in the learned world of natural history and clearly wished to be more closely involved with it, Milner's letters give no hint of dissatisfaction with his role as a writer. Indeed, he seems to have cultivated literary (and probably religious) contacts rather than scientific ones. His only known connection to more learned circles came with his election to the Royal Geographical Society in 1849.<sup>69</sup> This was probably a consequence of his most recent work, the *Descriptive Atlas of Astronomy and Physical and Political Geography* (Orr, 1849), which, although covering similar ground to the *Gallery of Nature*, made more of an impression on scholarly critics. By the early 1850s, Milner's longer works typically bore not only his name but also the credentials "MA, FRGS" (see Figure 5). Although the *Gallery of Nature* and the *Descriptive Atlas* had carried his name, his earlier RTS works had been anonymous. The change suggests that Milner had acquired a reputation as a sound writer of reference works and textbooks and that his name might now carry some authority on the title page. Gosse had a similar experience after his election to the Royal Society in 1856, which gave him a status that—as a writer with no university affiliation—he had previously lacked. However, as Martin had already discovered as a member of the Linnean Society, such election was not an unmixed blessing, a simple recognition of achievement. The credentials were welcome, but they were an expensive luxury and were quickly jettisoned in times of financial need. Milner commented in 1855 that, "though I append FRGS to my name, I am not strictly

<sup>67</sup> The RTS campaign to Christianize popular science, with which Milner and Martin were both involved, is discussed in Fyfe, *Science and Salvation*, Ch. 2. Concerns about the dangerous implications of the sciences had existed since at least the 1820s (see L. S. Jacyna, "Immanence and Transcendence: Theories of Life and Organization in Britain, 1790–1835," *Isis*, 1983, 74:311–329; and Desmond, "Artisan Resistance" [cit. n. 64]), but they were greatly exacerbated by the increased output of the book trade in the 1840s. See Aileen Fyfe, "Expertise and Christianity: High Standards versus the Free Market in Popular Publishing," in *Science and Beliefs: From Natural Philosophy to Natural Science, 1700–1900*, ed. David M. Knight and Matthew D. Eddy (Aldershot: Ashgate, 2005).

<sup>68</sup> On the theological strategies of slightly later science writers see Lightman, "Visual Theology of Victorian Popularizers of Science" (cit. n. 33). On Martin's use of the Bible as a source of information see, e.g., the beginnings of William Martin, *Our Domestic Fowls* (London: RTS, 1847); and Martin, *British Fish and Fisheries* (London: RTS, 1849).

<sup>69</sup> He was proposed as a member by George O'Gorman (elected in 1840) and Thomas Lee (elected in 1839); see his Certificate of Election, Royal Geographical Society Archives, London. My thanks to Sarah Strong for checking this for me.



**Figure 5.** Although Milner's earlier Religious Tract Society works had been anonymous, by the time the *Universal Geography* was published in 1850 his reputation as a reliable geographical writer had developed to such an extent that his name and credentials appeared on the title page of his works. This particular volume appeared as part of the series of school textbooks issued by the society, for which Milner also wrote histories of Rome and England.

entitled to it, as my subscription is in arrears for that space of time which disqualifies me.”<sup>70</sup>

Although Martin shared Milner’s evangelical faith, he was less satisfied with a vocation solely as a popular educator. He cherished an ambition to join the circles of learned natural history. While at the Zoological Society he had been able to do some original research and contribute to taxonomic debates, and throughout his life he hoped to return to that world. His lower social class was always going to prove an impediment, just as it had prevented his appointment as the society’s curator, but the barriers were not insuperable. This was clearly illustrated by the success of his former assistant, John Gould, who went on to become a Fellow of the Royal Society and was twice vice president of the Zoological Society.

Gould and Martin were both from lowly social backgrounds, although Martin seems to have had a better education than Gould, who needed the services of a secretary all his life. Both had wives who assisted their careers, Mary Jane Martin with her writing and Elizabeth Gould with her illustrations. Both were helped by acquaintances at the Zoological Society, including Nicholas Vigors (who shared Gould’s enthusiasm for birds and introduced Martin to both the SDUK and the Linnean Society). And both entered the publishing world in the early 1830s and hoped to use it to further their careers. While Martin secured commissions from publishers for introductory treatises and textbooks, Gould self-published ambitious, lavishly illustrated works on hitherto-unknown bird species.<sup>71</sup> Gould was fortunate, for his daring strategy worked incredibly well and funded the trip to Australia that made his name. Martin took the safer option with his early writings, perhaps hoping that his position as superintendent of the Zoological Society museum would ultimately lead to better things.

When Martin’s museum prospects fell through, writing was his only remaining hope for achieving his ambition. The knowledge he had acquired during his years at the Zoological Society served him well, but writing became such a time-consuming occupation that he had no opportunity for original research.<sup>72</sup> By the early 1850s Martin found himself hanging on to Gould’s coattails, as he tried to interest publishers in articles or books on hummingbirds to coincide with the display of Gould’s magnificent collection at the Zoological Gardens.<sup>73</sup> The tone of the references that his former associates from the Zoological Society, including Owen, Waterhouse, and Gould, continued to write for him makes it clear that, while they respected his work, they did not regard Martin as one of themselves. Gould explained that his works were “duly estimated by Professor Owen, Dr. Gray, and indeed everyone in the same walk of science who may be considered competent judges

<sup>70</sup> RLF 1385.2: Milner to RLF, 7 July 1855. On the status Gosse’s election to the Royal Society conferred see Thwaite, *Glimpses of the Wonderful*, p. 194. Thwaite notes that it cost Gosse £10 to join the society and £5 a year in dues. Martin had been elected to the Linnean Society in 1831 (one of his proposers was Nicholas Vigors of the Zoological Society), and he resigned his fellowship in 1844. See his Certificate of Election, 1831, and his letter to the Linnean Society, 18 Apr. 1844, in the Linnean Society Archives, London. My thanks to Gina Douglas for locating these for me.

<sup>71</sup> The SDUK connection is a guess, but Vigors was on the SDUK publications committee at the same time that he was on the Zoological Society committee to which Martin reported. On Gould see Sauer, *John Gould, the Bird Man* (cit. n. 4); Tree, *Ruling Passion of John Gould* (cit. n. 4) (Gould’s lifelong need of a secretary is noted on p. 8); and Barbara Mearns and Richard Mearns, *The Bird Collectors* (San Diego, Calif.: Academic, 1998), Ch. 7.

<sup>72</sup> Contrast Gosse, whose first wife’s small inheritance meant that he did not need to be writing constantly. On his free afternoons see Thwaite, *Glimpses of the Wonderful*, pp. 156–157, 163.

<sup>73</sup> The RTS refused a book but took an article that appeared in *Leisure Hour*, 22 Apr. 1852; see RTS CCM, 21 May 1851. H. G. Bohn published William Martin, *A General History of Humming-Birds, or the Trochilidae: With Especial Reference to the Collection of J Gould, FRS &c Now Exhibiting in the Gardens of the Zoological Society of London* (London: Bohn, 1852). On Gould’s hummingbirds see Mearns and Mearns, *Bird Collectors* (cit. n. 71), pp. 149–150; and Sauer, *John Gould, the Bird Man* (cit. n. 4), pp. 129–130, 240–241.

of their merit.” Owen wrote that Martin “has been most industriously and honorably occupied in diffusing sound scientific information, in Zoology.” Those solid adjectives were mirrored by Martin himself, who referred to his works as “not brilliant” but having a “plain utility.”<sup>74</sup>

From the beginning of his writing career, Martin had worked for publishers whose aim was to educate and improve the working classes. In writing for such periodicals as the SDUK’s *Penny Magazine* and the RTS’s *Leisure Hour*, Martin was well aware that he was producing educational material for a popular audience and not the sort of works that would gain the recognition of the learned elites. His *A General Introduction to the Natural History of Mammiferous Animals* (1841), commissioned by Whitehead but ultimately published by Wright & Company, had been a different matter and was aimed at a far more educated audience. But although it was based on his firsthand experience in the museum, it did not incorporate significantly new findings. As far as is known, Martin never traveled outside England, so he could not produce anything akin to Gould’s works on Australian birds or Gosse’s on Jamaican birds. Nor did he ever have the luxury of enforced idleness of the sort that enabled Gosse, recuperating from a breakdown, to discover the tiny creatures of the seashore. Martin’s expertise was in museum-based taxonomy—which Gosse found to be a dry and distorted study—and not in the close observation of living creatures that was becoming so desirable. Certainly, the introduction to the “mammiferous animals” does not appear to have brought Martin much attention from the learned. His grandest book, in terms of scope, was the anonymously published *Pictorial Museum of Animated Nature* (Knight, 1848–1849), whose two thick quarto volumes covered the entire animal kingdom (see cover illustration). Yet this was an illustrated three-penny part-work issued by Charles Knight, and it was firmly in the vein of popular education.<sup>75</sup> Many of Martin’s other writings reused material from these two synoptic works: he produced histories of the dog and the horse for Charles Knight’s “Weekly Volume” series (both 1845) and histories of the ox, sheep, and hog for Knight’s “Farmer’s Library” series (1849), as well as short works on songbirds, domestic fowl, and fish for the RTS “Monthly Volumes” (1846, 1847, 1849) and on the farmyard animals for George Routledge’s “Books for the Country” (1852).

In working for these publishers and writing these sorts of publications, Martin was praised by his RLF referees for producing “wholesome popular literature”—but not for making original contributions to natural history. Martin showed that he was aware of his role when he described his aim as being “to teach the principles of zoology *popularly* yet on a *truthful basis*.” As his health declined and he became more depressed about his financial situation and the difficulty of gaining a scientific reputation, it was some comfort to him to discover “that my labours were not unappreciated, even by the learned.” While clearly disappointed, Martin did persevere and made a success of his new career—in contrast to another former employee of the Zoological Society, the veterinary writer William Youatt, who sought the solution to his financial difficulties in prussic acid.<sup>76</sup> Martin

<sup>74</sup> RLF 1315.23: Gould to RLF, 2 Feb. 1859; RLF 1315.4: Richard Owen to RLF, 11 Apr. 1853; and RLF 1315.11: W. Martin to RLF, 16 Apr. 1853.

<sup>75</sup> Unlike most of his works, the title page of *A General Introduction to the Natural History of Mammiferous Animals* announces his authorship: “By W. C. Linnaeus Martin, FLS.” The date of publication and the subject matter lead me to suspect that this is the work Whitehead had commissioned. Gosse’s view of museum-based taxonomy—Martin’s area of expertise—is made clear in Thwaite, *Glimpses of the Wonderful*, pp. 123–124. Knight mentions *The Pictorial Museum of Animated Nature* and its intended audience in his memoirs; see Charles Knight, *Passages of a Working Life during Half a Century: With a Prelude of Early Reminiscences*, 3 vols. (1864–1865; London: Knight, 1873), Vol. 3, pp. 18–20.

<sup>76</sup> RLF 1315.11: W. Martin to RLF, 16 Apr. 1853. Youatt’s suicide is clear from his obituary in the *London*

achieved a sound reputation in the book trade and was known as a reliable writer of introductory works. He was also respected by more learned scholars, who appreciated that he wrote his popular works from a basis of practical, hands-on experience, unlike those writers who gained all their knowledge secondhand from others' books. For Milner, such an acknowledgment would have been enough, but for Martin it was a disappointing contrast to the reputation as a man of science he had once hoped to build.

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Existing accounts of the activities of scientific writers have focused more on the works produced than on the experiences of those who wrote them, largely because of the availability of historical evidence. What evidence we do have about the rewards and pleasures of scientific authorship tends to pertain to the well-known men of science who found it a useful way to supplement their incomes or, in the later nineteenth century, to successful professional popularizers. The letters of William Martin and Thomas Milner open a window on a different set of midcentury writers, revealing the standard of living it was possible to achieve as well as the pitfalls that lay in the way. The emphasis on everyday life reminds us that science writing, as much as science itself, had its practical side. Equally, the emphasis on vocation reminds us that, although men of science might dismiss popular writers as "booksellers' hacks," the writers themselves had different views about the value of their work. It is important not to take at face value the assessments of men of science who had a vested interest in distinguishing so emphatically between themselves and popular writers. We need to consider those writers' own accounts and remember that they could see themselves as "conscientious workmen" in the cause of science, education, and perhaps religion.

In the early nineteenth century, William Martin's dream that natural history writing for a general audience might be a route to a museum job, recognition from other learned men of science, and perhaps even membership in the Royal Society might have been realized, though it was never very likely. But by the middle of the century, and certainly thereafter, the changing situation with regard to expertise and professionalization in the sciences put such dreams out of reach. Rather than some vaguely defined "recognition" and an FRS, the goal for young men of a scientific bent had become a job in a university or government institution, and it was to be achieved through the publication of original research and, ideally, a scientific university education. The kinds of writings Martin produced remained an acceptable means of paying the bills until a proper job came along, but they were not going to help an aspirant secure such a job. Lacking in social status and education, and without the time and opportunity to pursue original research, Martin did well to gain a reputation as a producer of wholesome popular science literature, even though—with the example of John Gould before him—Martin himself found it difficult to see things that way.

Martin and Milner were writing at a time when the professions of science and of literature (not to mention that of science popularizer) were still being negotiated. They are typical of a group of relatively unknown writers of cheap, introductory informative works who worked for publishers committed to the cause of education and self-improvement. These publishers did not pay lavishly, but they did offer regular work and the chance to educate large numbers of lower-middle- and working-class readers. Books written by well-

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*Times*, 14 Jan. 1847, rpt. in John Clewlow, "The Death of William Youatt: An Update," *Veterinary History*, 2000, 10:74–75. Youatt had been medical superintendent of the Zoological Society's menagerie. I thank Ben Marsden for drawing Youatt to my attention.

known men of science and published by respected literary houses might be talked about more in society and reviewed far more widely in the periodical press, but it was the writers for the popular press who had the real opportunity to exercise an influence. Men of science might fear that, owing to their presumed lack of scientific expertise, these writers would mislead their readers; but in their anxiety they failed to appreciate that a different sort of expertise was required.

In the terms of their day, both Martin and Milner were professionals. Whether being a professional writer on the sciences counted as a respectable or high-status occupation depended on one's perspective. Both men were well respected for their literary expertise, though their claims to scientific expertise were much weaker. Yet despite the violent rhetoric associated with *Vestiges* that would dismiss all generalist writings as being "merely popular," there are hints that men of science in fact recognized the existence of "wholesome popular literature" and respected its writers. Martin's works could be praised as well written and as based on his firsthand experiences in the museum, while Milner's were said to show a respect for scientific authority and a careful, rather than slap-dash, use of secondary sources. Particularly in the way that Martin's works were described by his RLF referees, it is apparent that there was respect in the scientific community for those who could convey the facts of science intelligently and conscientiously. Later in the century, these "conscientious workmen" would be more widely recognized and their usefulness praised, as the scientific community started to take the existence of scientific popularizers for granted. By that time, however, attitudes to the functions of research writing, as opposed to generalist writing, had changed so much from those of Forbes's youthful days that the sort of transformation Martin had hoped to achieve was no longer conceivable. Rather, the successful popularizer was one who shared Milner's enthusiasm and conviction that being an educator was in itself a worthy vocation.